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THE IRON TRADE REVIEW

Single Copies 15 Cents | CLEVELAND, SEPTEMBER 13, 1917 | Four Dollars a Year

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BUFFALO, N. Y.
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RIVETS SPIKES
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Engineering Directory, pages 96-97. Classified Advertisements, pages 106-125.

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THE IRON TRADE REVIEW

Vol. LXI Cleveland. September 13, 1917 *No. 11*

Federal Needs Control Steel Trade

Government Requirements Grow Heavier, and Private Business is Displaced—Buying Lags as Washington Delays Announcement of Price Policy—Scarcity of Fuel May Force Some Plants to Shut Down

FEDERAL control of the iron and steel industry is as much a fact today as though congressional sanction had been invoked. Government orders and needs determine the action of every steel company executive, whether or not he holds a contract from Washington officials. If he has such a contract, he is obliged to complete it at once. If he does not hold such a contract, the manufacturer finds his orders for material either rejected or accepted for delivery at an indeterminate date. Neither buyer nor seller can gage their future operations with any degree of assurance and the pause in private buying is mutually satisfactory.

The fetters which government requirements have forged around the iron and steel industry have been voluntarily assumed and are being willingly retained. They are galling in some instances where the government plans to distribute the burden equally among different producers have gone astray. One large steel company, for instance, is supplying certain commodities at well over 100 per cent of its capacity—a condition that is made possible by shifting certain equipment to uses for which it was not intended. Of the immense facilities and output of this plant, fully 75 per cent are being concentrated on government work. Although this proportion is not infrequent, the industry as a whole has only a small per cent of its capacity so engaged, but the essential need for prompt delivery gives this a dominating influence.

The uncertainty engendered by the delay at Washington in announcing the government's price policy now pervades the entire industry. Spasmodic rumors concerning the decision at Washington are being circulated, but are freely discounted.

Fuel is Scarce

The coal and coke situation is giving increasing concern. In the east, many steel mills which are running largely on government work face the possibility of shutting down unless gas coal is supplied more freely. Some of these mills are unable to build up more than a day's reserve and have appealed to Washington. Assurances have been given by Dr. Garfield that sufficient tonnages of coal will be directed to plants turning out products for the government. The position of those mills which have no government business is uncertain and many of these may be forced to suspend operations. Coal production threatens to be curtailed unless some modifications of the new prices are made. In the same way, some consumers of coke fear that the government's coke prices when announced may result in constricting production. The coke output already is insufficient to meet the demands of the industry. One disturbing factor, the car supply, was greatly improved last week, only to have production cut down by the unsatisfactory labor conditions in the Connellsville region. Contracts for furnace coke for 1918 have been closed this week at $8.50 a ton, ovens. Spot furnace rules at $12.50 to $13.50 a ton, ovens.

Pig Iron

Lack of buying prevents current pig iron quotations being fully tested. The small tonnages involved in business now being taken are generally for immediate use and the prices continue at about the same level. Small lots of spot iron in the east brought higher prices, such as $55 for No. 2X against usual quotations of $51 to $53, furnace. The resale market is fairly well cleaned up. Bessemer, valley, is quoted at $51, with basic bringing $48.

Government Buying

Plate requirements of the government continue to grow heavier and large tonnages were distributed this week. Military buildings in France will take 25,000 tons, and similar structures in this country about 5000 tons. Tentative inquiries for sheets are appearing, one calling for 11,000 tons. Orders for cast iron pipe for a New Jersey camp have been distributed. The navy department has placed orders for coke at $3 for furnace and $3.50 for foundry grades.

The Iron Trade Review

EDITORIAL

While Business Waits

TINKERING with a nation's economic system, where the hand of a novice may undo the work of a master, is not without its dangerous phases. Extreme caution has characterized the movements of the government in its task of determining the prices of the commodities it needs for the promotion of the war. To the deferred announcements in respect to these prices is attributed in great measure the indecision and consequently diminished market activities of the present time. An important phase of the huge task of determining equitable prices, in fact the hinge upon which the whole question turns, lies in a determination of the proper time to make adjustments, as well as the system to be followed.

Three plans have been evolved by the government in arranging to meet the obligations incurred by it in purchasing steel, copper, spelter and other metals and war materials. Each plan has its advantages, its drawbacks and its advocates. Briefly, these schemes embody the following features: The establishment of a fixed price and purchasing on the basis of this standard; the setting of a provisional price with the stipulation that additional compensation is to be given later according to the results of a final investigation, and the placing of orders without any agreement as to prices at the present time.

Quite a number of government orders have been taken by producers on the basis of the fixed-price plan. According to this scheme, small producers are materially benefited as it enables a quick turning-over of capital and obviates any necessity for retrenchment which might become necessary under other plans. It may also tend to neutralize the influences that have had a depressing effect on market activities, once that all prices finally are determined. Selling on this plan at the present time, however, is apt to be unfair to the producer because of the necessarily hasty weighing of data involved, to say nothing of the errors of omission in the final computations and the deferred production activities pending the compilation of the accumulated data. On the basis of a provisional price with a correction to be made later, it would seem that no added advantages over the preceding plan would accrue, while in addition to the disadvantages previously enumerated, it is evident that there would be a disposition on the part of the government to consider the deal as closed. The plan of taking government orders without any definite figure and leaving the prices for future determination may have a deterring influence on the small producer's business, owing to his inability to quickly turn over his capital. A curtailment of industrial expansion might follow in view of the financial obligations which might be imposed on all producers. A remote possibility exists that business eventually might be unstabilized when the work of determining prices is undertaken, through the actions of meddling politicians and attendant costly litigation. Contrasted with this, however, it may be said that a temporary lull in the present situation would permit producers to concentrate on production at a most advantageous time; that adequate time would be available for an enumeration of all contributing factors; that market uneasiness likely would subside in view of the promise of an equitable adjustment, and that data could be collected and weighed with a true regard for the importance of the interlocking elements.

Uncertainty is fatal to business and it would seem that the latter plan promises a rapid adjustment of this condition. Producers, both large and small, likely would benefit by this scheme, as financial assistance from the government to those needing it should be forthcoming. Many producers are in favor of the proposal and have signified their willingness to supply their products to the government on this basis. Instances are known of several steelmakers who have accepted government orders with no agreement whatever as to the price to be paid for their product. The quick universal adoption of this plan, the bettered market tone and the increased production which are bound to result from the more nearly normal status of affairs, would benefit the iron and steel industry and have a favorable effect on business in general.

Japanese Want Plates

THE embargo on steel plates is stirring up the Japanese. They have sent representatives to Washington who are pointing out that thousands of workmen in Nipponese shipyards are idle because of a plate shortage resulting from the embargo. Stimulated by subsidies to builders as well as to shipping companies, the growth of the shipbuilding industry in Japan since the beginning of the war has been remarkable. Orders have exceeded the capacity of more than 20 yards and four new plants are now approaching completion. The demand for ships is so great that sales of recently constructed vessels were made at Kobe recently on a basis of $340 a ton. Japanese yards are now

constructing $50,000,000 worth of vessels for Great Britain. They are dependent, however, almost exclusively on the United States for their supply of ship plates. The Japanese shipbuilders, therefore, are urging the government to make an exception in the embargo regulations in favor of Japan, on the plea that if such action is not taken their industry will be ruined. They also point out the value to the allies of the ships they are now constructing for the British government.

Undoubtedly, there is considerable justice in the Japanese demands. It should not be forgotten, however, that our supply of ship steel is hardly sufficient for our own needs at present, in spite of our tremendous production. Our construction plans now call for 1270 new steel ships at an expenditure of $1,934,000,000. It also may be pointed out that up-to-date the Japanese have been using their merchant marine almost exclusively for furthering their own commercial interests on the Pacific and in general they have taken care to keep their vessels out of the danger zone on the Atlantic. If our Asiatic allies were a little more willing to risk some of their bottoms in the war zone, their plea for a lifting of the embargo on plates would have a more sincere appeal.

War's Lessons Promote Efficiency

MANY industries in the United States have been subjected to a most intensive training during the past three years. Under the increasing stimulus of demands for multifarious supplies of war and in spite of the tendency toward extravagance inspired by huge war profits, manufacturers are rapidly putting themselves in a fortified position against aggressive post-bellum competition. When the present lucrative margins of profit have tapered off, the efficiency and economy now being introduced into many plants will prove influential factors in winning the nations just portion of the world's trade. Shortage of labor has been an impelling motive behind the development and improvement of labor-saving equipment. In foundries, machine shops, railroads and mills innumerable new devices initiated during this period have replaced men and effected economies in every department. Recovered by-products formerly thrown on scrap piles or scattered to the four winds, are responsible for a saving of many millions of dollars yearly. Indirectly, standards of production have been raised through the appreciation by employers that output functions largely through the health and happiness of the workers. Enormous strides have been taken in the improvement of working conditions. Mills and factories are better ventilated; eye strain has been reduced to a minimum by the installation of scientifically designed lighting units; safety devices have curtailed considerably the number of off hours due to accidents. All these factors contribute to the composition of an industrial fiber which should materially aid the United States in maintaining its high position among the manufacturing nations of the world.

Another Useless Investigation

CONGRESS, long famed for its apparent failure to accomplish much of anything in its special probes, has just begun an investigation which, while apparently well intended, is likely to wreak as much if not more damage to the operation of America's war machinery than congress itself has caused by its delay in providing the necessary war legislation. Investigation of the shipment of defective ammunition to the American forces in France means practically the suspension of the army ordnance bureau during the period of the inquiry. It means that the officers of the department must put aside their war plans and go back into the files and records to dig out information congress wants and to take more time to sit in hearings and answer every question committeemen will ask. Congressional inquiry into the explosion of a shell on the MAGNOLIA, which killed two American Red Cross nurses, tied up the navy ordnance department for two weeks and put its chief, Rear Admiral Earle, under such strain as may possibly have affected immediate subsequent duties of the chief and the bureau. We offer no brief for either the navy or the army ordnance departments. But the defective shells shipped to General Pershing's troops were discovered before they could cause any damage and even now can be used in target practice. Blame for the defects apparently is due to chemical changes and not to any army officer. Any good the investigation now may accomplish will be offset by the delay of the bureau's important activities. If the investigation is to spur officers to absolute certainty in approving ammunition, the discovery of the defects in the cartridges in question will serve that purpose. Congress probably can accomplish as much after the war as now and formal notice to this effect with orders to preserve all records and documents, seems all that is necessary to inspire greater care among army officers and ammunition inspectors.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 568

PIG IRON

(Delivery this year.)

Bessemer valley	$51.00
Bessemer, Pittsburgh	51.95
Basic, Pittsburgh	48.95
Basic, eastern Pa.	50.00 to 52.00
Basic, Buffalo	54.00 to 55.00
Malleable, Pittsburgh	54.95 to 55.95
Malleable foundry, Chicago	55.00
Malleable foundry, Phila.	55.00 to 57.00
Malleable foundry, Buffalo	54.00 to 55.00
No. 1X, Phila.	54.00 to 55.00
No. 2 foundry, Pittsburgh	53.95
No. 2 foundry, Cleveland	54.00 to 55.00
No. 2 foundry, Ironton	54.00 to 55.00
No. 1 foundry, Chicago	56.00
No. 2 foundry, Chicago	55.00
No. 2X foundry, Phila.	51.50 to 53.50
No. 2X foundry, N. J. tide	51.75 to 53.75
No. 2X foundry, Buffalo	53.00 to 55.00
No. 2 plain, Philadelphia	50.50 to 51.50
No. 2 plain, N. J. tide	50.75 to 51.75
No. 2 plain, Buffalo	52.00 to 54.00
No. 2 southern, Birmingham	47.00 to 49.00
No. 2 southern, Cincinnati	49.90 to 51.90
No. 2 southern, Chicago	50.00 to 54.00
No. 2 southern, Phila. del.	51.50 to 52.50
No. 2 southern, Cleveland	51.00 to 52.00
No. 2 southern, N. Y.	51.25 to 52.25
No. 2 southern, Boston	52.00 to 53.00
No. 2 south. interior, N. E.	53.00 to 54.00
No. 2 southern, St. Louis	48.50 to 52.50
Virginia, No. 2X, furnace	51.00 to 51.25
Virginia, No. 2X, Phila.	53.75 to 54.00
Virginia, No. 2X, Jersey City	54.00 to 54.25
Virginia, No. 2X, Boston	54.25 to 54.50
Gray forge, eastern Pa.	45.00 to 48.00
Gray forge, Pittsburgh	52.95 to 53.95
Gray forge, Birmingham	45.50 to 46.00
Silveries, 8 per cent, furnace	80.00 to 85.00
Silveries, 8 per cent, Chicago	85.00 to 92.50
Low phos. standard, Phila.	90.00 to 92.00
Low phos. Lebanon furnace	80.00
Low phos., Pittsburgh	82.00 to 85.00
Charcoal, Superior, Chicago	59.50 to 62.00
Charcoal, Superior, Buffalo	55.00 to 60.00
Charcoal, Birmingham	55.00 to 60.00

COKE

(At the ovens.)

Connellsville furnace	$12.50 to 13.50
Connellsville furnace, contract	10.00
Connellsville foundry, contract	12.50
Connellsville foundry	13.00 to 14.00
Wise county furnace, contract	10.00 to 11.00
Wise county foundry, contract	11.50 to 12.00
Pocahontas furnace, contract	10.50 to 11.00
New River foundry, contract	13.50 to 14.00
New River furnace, contract	8.50 to 10.00

FERRO ALLOYS

Ferromanganese, prompt	$400.00
Ferromanganese, last quar.	375.00 to 390.00
Spiegeleisen, 20 per cent furnace remainder of year	80.00 to 82.50
Ferrosilicon, 50 per cent, Pitts.	225.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	140.00 to 150.00
Bessemer ferrosilicon, 9 per cent	$94.00
Bessemer ferrosilicon, 10 per cent	95.00
Bessemer ferrosilicon, 11 per cent	97.50
Bessemer ferrosilicon, 12 per cent	100.00
Bessemer ferrosilicon, 13 per cent	105.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$75.00
Open hearth, Philadelphia	90.00 to 100.00
Open hearth, Youngstown	90.00
Bessemer, Pittsburgh	75.00
Bessemer, Youngstown	80.00 to 85.00
Forging, Pittsburgh	125.00
Forging, Philadelphia	115.00 to 125.00
Forging, Chicago	125.00

SHEET BARS

Open hearth, Pittsburgh	$85.00
Open hearth, Youngstown	90.00
Open hearth, Cleveland	90.00 to 95.00
Bessemer, Pittsburgh	85.00
Bessemer, Youngstown	90.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$90.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts., nom.	4.00c to 4.50c
Sheared skelp, Pitts., nom.	4.50c to 5.00c

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	4.00c to 6.00c
Structural shapes, Phila.	4.685c to 5.185c
Structural shapes, N. Y.	4.695c to 5.195c
Structural shapes, Chicago	4.94c to 6.19c
Tank plates, Chicago	8.69c to 10.19c
Tank plates, Pittsburgh	8.00c to 9.00c
Bars, soft steel, Pittsburgh	4.00c to 5.00c
Tank plates, Philadelphia	8.185c to 10.185c
Tank plates, New York	8.169c to 10.169c
Bars, Pbgh., 1918 del.	3.50c to 4.50c
Bars, soft steel, Chicago	4.50c
Bars, soft steel, New York	4.445c to 4.695c
Bars, soft steel, Phila.	4.435c to 4.685c
Cotton ties, Pitts., Aug.	$2.12
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.685c to 5.185c
Bar Iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.695c to 5.195c
Bar iron, Pittsburgh	5.25c
Hard steel bars, Chicago	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.75c to 4.00c
Angle bars, Chicago, base	3.25c to 4.00c
Standard bessemer rails, mill	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	38.00 to 40.00
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	62.00 to 65.00
Spikes, railroad, Pittsburgh	6.50c to 7.00c
Spikes, railroad, Chicago	5.00c to 5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	5.25c to 6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(Prices of independent makers.)

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh	4.85
Barb wire, painted, Pittsburgh	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ⅜ in. proof coil, Pitts. 9.00c

Sheet piling, base, Pittsburgh 4.00c to 5.00c

Cold rolled strip steel, hard coils, 1¼ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

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SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c
No. 28, open hearth, Chic.	8.94c to 9.19c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	10.25c to 11.50c
No. 28, bessemer, Pitts.	10.25c to 11.50c
No. 28, open hearth, Chic.	10.44c to 11.44c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	8.69c to 8.94c
No. 10, open hearth, Phila.	8.185c to 9.185c

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom. $10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
⅜ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
⅜ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3¼ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	68.50
Six-inch and over, Chicago	65.50
Four-inch, New York	68.50
Six-inch and over, New York	65.50
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh	5.25c
Boiler rivets, Pittsburgh	5.35c
Tinner's rivets, Pittsburgh	40 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter.)

Rolled thread	40 off
Cut thread	35 and 2½ off
Larger or longer	25 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts.)

Rolled thread	40 and 10 off
Cut thread	40
Larger and longer	30
Cold pressed, semi-finished, hexagon nuts	50, 10 and 5
Gimlet and cone point lag bolts	40 and 10

NUTS

Hot pressed, square, blank	1.10 off
Hot pressed, square, tapped	1.90 off
Cold pressed, square, blank	1.50 off
Cold pressed, square, tapped	1.25 off
Hot pressed, hexagon, blank	1.90 off
Hot pressed, hexagon, tapped	1.70 off
Cold pressed, hexagon, blank	1.50 off
Cold pressed, hexagon, tapped	1.25 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products September 12, average for August, 1917, average for June, 1917, and average for September, 1916. Prices are those ruling in the largest percentage of sales at the dates named

	Prices Sept. 12, 1917.	Average prices Aug., 1917.	June, 1917.	Sept., 1916.
Bessemer pig iron, Pittsburgh..	$51.95	$55.55	$55.20	$22.20
Basic pig iron, Pittsburgh.....	48.95	52.25	50.20	19.075
No. 2 Foundry pig iron, Pitts..	53.95	55.55	51.025	19.50
No. 2 Foundry pig iron, Chic...	**55.00**	55.00	51.00	18.62
Lake Superior Charcoal, Chicago	59.50	59.50	51.80	19.75
Malleable, Chicago	55.00	55.00	56.50	19.12
Southern No. 2, Birmingham...	48.00	48.00	35.75	14.38
Southern Ohio No. 2, Ironton..	55.00	55.00	38.60	18.25
Basic, eastern Pa.....	51.00	51.00	46.75	20.00
No. 2X Virginia, furnace.....	51.00	51.90	46.50	17.50
No. 2X foundry, Philadelphia..	52.50	53.40	47.50	19.75
Ferro mang., delivered.....	400.00	400.00	431.25	164.00
Bessemer billets, Pittsburgh....	75.00	93.00	93.75	45.00
Bessemer sheet bars, Pittsburgh	85.00	96.00	101.25	45.00
Open hearth sheet bars, Pitts..	85.00	96.00	101.25	45.00
Open hearth billets, Pittsburgh.	75.00	93.00	93.75	45.00
Steel bars, Pittsburgh.....	4.00	4.00	3.625	2.60
Steel bars, Chicago.....	4.50	4.50	4.50	2.79
Iron bars, Philadelphia.....	4.935	4.914	4.259	2.659
Iron bars, Cleveland, local del'y	4.75	4.75	3.50	2.40

*Seaboard.

	Prices Sept. 12, 1917.	Average prices Aug., 1917.	June, 1917.	Sept., 1916.
Iron bars, Chicago mill.....	$4.50	$4.50	$4.00	$2.35
Beams, Chicago	6.19	4.94	4.63	2.79
Beams, Pittsburgh contract.....	4.50	4.50	4.00	2.60
Beams, Philadelphia	4.935	4.914	4.659	2.759
Tank plates, Pittsburgh.....	8.00	8.80	4.50	2.95
Tank plates, Chicago.....	10.19	9.59	7.92	3.19
Tank plates, Philadelphia.....	9.185	10.164	9.659	3.909
Sheets, blk., No. 28, Pittsburgh	9.00	9.00	8.137	2.887
Sheets, blue anld., No. 10, Pitts.	8.50	8.50	5.575	2.925
Sheets, galv., No. 28, Pittsburgh	10.25	10.25	9.95	4.225
Wire nails, Pittsburgh.....	4.00	4.00	3.625	2.60
Connellsville fur. coke, contract.	**10.00**	10.00	8.50	2.487
Connellsville fdy. coke, contract.	**12.50**	12.75	10.875	3.175
Heavy melting steel, Pittsburgh	35.00	34.60	40.00	16.125
Heavy melting steel, eastern Pa.	30.50	32.80	36.625	15.00
Heavy melting steel, Chicago...	33.00	33.10	37.00	15.50
No. 1 wrought, eastern Pa.....	44.50	46.24	47.875	21.00
No. 1 wrought, Chicago.....	37.00	35.00	41.75	16.62
Rerolling rails, Chicago.....	41.00	41.90	46.00	16.87
Car wheels, Chicago.....	31.00	30.70	37.00	12.00

(For Additional Prices See Page 568)

Small Sales Rule Dull Iron Market

Current Transactions in Pig Iron Are for Small Tonnages With Price Levels Stationary—Some Sales in East at Advanced Quotations —Deliveries Falling Behind

Pittsburgh, Sept. 11.—Without negotiations of any importance transacted during the past week and none pending, the pig iron market in this district is at a standstill. Buyers are hesitating about putting out inquiries and furnace interests are showing no anxiety to sell. The trade continues to wait on the government to announce its price-fixing policy and in the meantime, producers are operating on contracts and consumers are specifying according to their immediate needs only. Ordinarily, at this time an active buying movement sets in, but this development this season is not expected to take place until trade conditions become more settled. More or less apprehension is entertained that transportation conditions this winter will be worse than they were last winter and the belief prevails that this may be a factor which will induce buyers to come into the market as quickly as a state of certainty as to prices becomes established. The resale market apparently is almost cleaned up. Stocks of consumers also seem to be in better shape than had been anticipated in view of their limited buying for some time past. Bessemer iron continues to be quoted at $51, valley, and basic iron at $48, valley. In few instances, sellers are asking as high as $53, valley, for bessemer iron, and one broker has been asking $50 for basic. Small tonnages of No. 2 foundry were sold during the week on the basis of $53, valley, or $1 a ton less than the level that has been prevailing heretofore. One sale of this grade, involving a small tonnage, was made at $52.50, valley. No sales of malleable iron have been reported. This grade continues to be quoted at $54, valley.

Discount U. S. Price Rumors

New York, Sept. 11.—Numerous rumors forecasting the government price expected to be established in the near future, were among the features of interest in the pig iron market in this district during the past week. One report originating in Wall street, had it that $38 would be the government price; another had it that the price would be $35, and another that the government prices would be based on $36, furnace, for No. 2X. These reports were considered, however, to be more diverting than reliable.

Market activity continues to be restricted to small lots of foundry which melters need for prompt and nearby consumption. Most of these purchases involve one or two carloads and a lot of 500 tons of No. 2X, which was placed during the week was exceptional. The minimum price on No. 2X continues $51, eastern Pennsylvania furnace, while some furnaces on single carloads have obtained as high as $55. The market generally may be quoted on the basis of $51 to $53, eastern Pennsylvania furnace, for No. 2X. Central Pennsylvania foundry may be had for prompt shipment at $52, furnace, but none has been sold in this district lately. No sales of Buffalo iron have figured here recently. Small lots of Virginia foundry continue to be sold occasionally into this district for prompt shipment, at $51 to $51.25 for No. 2X.

Very little southern iron has been bought by melters in this district recently, due to the growing difficulty in obtaining shipment from the south. Despite low prices which have

been offered in the west, southern furnaces have offered nothing less here, so far as known, than $48, Birmingham. On resale southern iron, the lowest price which has developed here is $46, Birmingham. Low phosphorus pig iron is enjoying a better inquiry than for some time past. Two eastern consumers want 3000 tons and 1500 tons each, and a Pittsburgh brokerage house has an inquiry out for 1500 to 2000 tons.

Export inquiries, due to the embargo, are of little importance. Among such inquiries is one for a round tonnage of bessemer for Switzerland. It is not expected that any quotations will be submitted on this iron, since it is regarded as unlikely that an export license will be granted. Nothing further yet has developed in regard to the 30,000 tons or more of low-phosphorus bessemer for which the Italian government was in the market. This inquiry recently was submitted to B. M. Baruch for disposal. Well informed authorities say that Italy now is having no difficulty in obtaining practically all of her pig iron requirements from England.

Few Sales at Buffalo

Buffalo, Sept. 11.—Though new orders are scarce, the market shows no weakness, as stocks are scarce and consumers who ordered some time ago are insisting on prompt delivery. The iron bought during the past week has been principally for the government, which has been in the market in this district for a moderate tonnage. The orders have been placed with the stipulation that all commercial business must be laid aside.

Furnaces are facing a real crisis in the coke situation, due to inability to secure sufficient coke, and with that of poor quality. Production in consequence is low, the loss being equivalent to one stack being out of blast. The low production is resulting in undelivered tonnage being dammed up. Some resale iron has been on the market this week, one producer having about 500 tons.

One interest, which will begin the manufacture of finished steel, does not expect to be able to quote for some months. Even at that time, its own mill will take most of the product. The new furnace of the Donner Steel Co., which went into blast late in August, and the older stack are both running on basic.

Small Lots Wanted

Cleveland, Sept. 11.—Occasional sales of small lots to supply a customer's imperative requirements, mark the only break in an unusually quiet market. A plowmaker has taken 150 tons of No. 2 foundry at $53, furnace. A large foundry in this district has taken 100 tons of foundry iron at $53, valley. The total of small sales represents a fair tonnage, although individual orders are small. One firm has sold more iron so far this month than in the last three weeks of August. The absence of all but spot buying precludes a test of quotations, which under present conditions remain at the same level.

Sales at Higher Figure

Philadelphia, Sept. 10.—While the volume of pig iron business in this district continues of negligible proportions, prices are holding firm and, in fact, occasional sales have been made at higher figures than generally have been obtained of late. For instance, at least two eastern Pennsylvania furnaces have sold one or more carloads of No. 2X for prompt shipment at $55, furnace. At the same time, however, other sellers have done lower and the market generally still may be quoted at $51 to $53, eastern Pennsylvania furnace, for No. 2X. Such business as is being placed in the foundry grades involves only odd lots for quick shipment. The only recent inquiries for futures, involving 3000 tons of special iron for the Lenoir Car Works, Lenoir City, Tenn., and 400 tons for the Southern railroad have not yet been placed, although the former interest is understood to have bought a few hundred tons of special iron not involved in its inquiry. Copper-bearing low-phosphorus iron now may be quoted at around $80, eastern Pennsylvania furnace, and a good-sized tonnage of this grade was sold during the week at a price near this figure. Business in standard low phosphorus included only one small lot. Two inquiries for malleable came out from brokers, who want about 500 tons each. Basic and bessemer are featureless.

Chicago Market Waiting

Chicago, Sept. 12.—With possible government price fixing still a strong factor, the pig iron market in this district is waiting developments. Furnaces are not seeking business and melters are not inquiring. On carload lots from furnace the quotation remains firm at $55, Chicago furnace, but comparatively little iron is available from this source. Under present conditions of coke supply more off iron is being made than usual and furnaces are applying this on contract at price concessions wherever possible. Such iron as cannot be shipped in this way is being sold as spot iron at proportionate reduction. There has been no real demand for contract iron since the middle of the year.

Southern producers as a rule are falling further behind on delivery and the condition in this respect is worse than ever before. Under this situation southern makers are practically out of the market on contracts as it is probable they are fully sold or oversold to the middle of 1918. Resale iron for immediate delivery has sold recently at $47 to $48, Birmingham. Warrant iron has been disposed of largely and comparatively little remains on yards.

Jackson county silveries are moving at $75 to $80, furnace, for 7 to 8 per cent. This iron is available only in prompt carloads and contracts are not being taken. Apparently no Tennessee silveries are available for this year's delivery.

Lake Superior charcoal is sold to July 1, 1918, and melters have insistently demanded deliveries on contracts. Some resale charcoal iron is appearing and holders for the most part are asking $60, shipping point. General indications are that when the government announces a decision, whether a price is fixed or not, considerable buying will result immediately. Many factors indicate an impending shortage and as long as the melt continues at high speed a strong demand for iron will exist when certainty is restored.

It is believed that much iron made for export has been diverted to domestic users through embargoes on shipments, warrant iron is nearly exhausted, stocks on furnace yards have been cleared up, and melters have been using their reserves largely. These facts tend to lessen the elasticity of the market and stiffness will result, in the opinion of many observers, as soon as the latent demand develops.

Less Resale Iron

Cincinnati, Sept. 11.—A few inquiries for malleable have been issued by users who need the iron for shipment in the first half of next year. A belief that the prospective buyers were not ready to place orders has held back the lowest quotations. That $53, Ironton, would be acceptable on desirable business is affirmed. Sales in the past few days have been below normal, even as compared with the previous six weeks, which were considered as being the dullest period in years. Southern makers are now more disturbed about supplying customers' needs than they are in disposing of more iron. The supply of resale iron in the south is more limited than had been generally supposed. Quotations are unchanged, and buyers are only

covering for their immediate needs. Southern No. 2 foundry, in carload lots, has brought $50, Birmingham, but other furnace sales have been made at $48, and lower in some cases where there was any question as to the analysis of the iron. Resale iron is not in evidence very largely; a little has been disposed of at $46.50. The average quotation is from $47 to $48, Birmingham.

Resale Offered Lower

St. Louis, Sept. 11.—The pig iron situation is unsettled. Resale iron is lower but southern producers, who supply the bulk of the tonnage to this district, are asking firm prices. A further contradiction is found in the fact that the rate of consumption continues enormous, and well up to recent record averages, while consumers are virtually all holding aloof from the market. Few inquiries are out, and buyers not covered by contract are getting along from hand to mouth, preferring to take a chance on the future rather than cover their wants now. Offers of southern No. 2 on resale were made as low as $44, Birmingham basis, and efforts to get bids on the metal were not successful. A few cars changed hands, sales showing a range of $44 to $47.50. The price is governed by the urgency of the consumer's need and the size of the lot offered. The principal foundries are operating at capacity, and report no slacking up in offers of new business. Until the government program is disclosed and a basis established, there is little likelihood of the market returning to normal and shaping itself on legitimate demand and supply lines.

Southern Quotations Unchanged

Birmingham, Ala., Sept. 11.—Inquiries for pig iron are being received by southern furnace companies and a few sales are being made, but the weakness of the market is still admitted. The quotations are still being held at the high mark, $50 per ton, No. 2 foundry and basic, delivery during the balance of this year, and $48 a ton for 1918. A few small lots of iron and of special analysis and high silicon iron sold during the past few days at $51 to $53 a ton, delivery during the last quarter of this year. Production is being kept up though there was some apprehension that the labor troubles threatening in the coal mining sections would disturb the coke production and ultimately hurt the iron output. Iron production in Alabama in August showed a very slight increase over July. A good start has been made this month and the Trussville furnace may get in a couple of weeks' time. One furnace that has been on basic for the past several weeks has been changed back to foundry in order to meet demands. Furnace companies are still waiting anxiously to see what the government is going to do in the way of regulating the market, fixing prices, etc. Stopping the unlicensed exportation of pig iron, and especially the movement of some of the product to Sweden, brought about a resale of some 12,000 tons and more of southern iron recently. One report is that this iron sold at $46 and $47 a ton. Deliveries continue steady and the accumulated stocks are going down steadily. The largest stock of iron is under 70,000 tons, and the aggregate iron on yards is estimated at not over 100,000 tons.

While no statements are given out, because of government contracts, steel mills in the Birmingham district are working to the maximum and are moving out their products steadily. The Steel Corporation and independent companies, including the Gulf States Steel Co., are producing steadily, with sales ahead to require full output for some months.

Close 1918 Coke Contracts

Business Taken at $8.50, Ovens, or on Sliding Scale—Output Cut as Labor Conditions Remain Unsatisfactory

Pittsburgh, Sept. 11.—Contracts for Connellsville furnace coke for all of next year have been closed during the past week. They have been made on a straight basis of $8.50 per ton, ovens, and also on a sliding scale of 4.50 to 1 and of 5 to 1 on basic iron, Mahoning and Shenango valleys. With this grade quoted at $48, these scales represent prices of $10.66-2/3 and $9.60 a ton, ovens, respectively.

A feature of the week was the buying of considerable quantities of furnace coke by many of the furnaces in the Pittsburgh district, many of whom evidently were desirous of covering their requirements for one and two weeks. Consumers apparently are concerned over the forthcoming price-fixing policy of the government and feel that if it is not favorable, production will be curtailed and difficulty experienced in obtaining fuel. Prices paid for furnace coke for immediate delivery this week have ranged from $12.50 to $13.50, ovens. Small lots of foundry coke have been sold and this grade is quoted at $13 to $14, ovens. The car supply in the Connellsville regions last week was 90 per cent, as compared with 70 per cent the week previous, but the labor situation was not satisfactory, and as a result there were many cars which remained idle, waiting to be loaded. The priority shipment order of the war industries board giving preferential movement to lake coal is causing much uneasiness among furnace interests and some of them have been compelled to resort to their stocks to get this fuel to continue operations. Unless the order is modified, they say it will be necessary to bank furnaces and close down steel plants, as has already been done in the east. The production of coke in the Connellsville regions for the week ending Sept. 1 was 336,170 tons, as compared with 358,504 tons for the immediately preceding week, according to *The Connellsville Courier*.

Buy Furnace Coke

Philadelphia, Sept. 10.—Considerable business in furnace coke has been done in this district during the week at varying prices. Contracts have been made at all the way from $8 to $10, Connellsville ovens, according to the delivery. A tonnage over the remainder of this year was sold at $8.50, Connellsville, and on another lot somewhat less was done. A tonnage with deliveries commencing now and extending well into next year was sold at $10. Spot furnace coke was sold at $13, ovens. Mandatory orders have been placed here by the government during the week at $3, ovens, for furnace coke and $3.50 for foundry coke. Specifications accompanying the orders, however, have been such as to make it impossible in most cases, to fill them, and it is expected that the government will get around this situation by accepting recognized brands of coke.

Prices Hold

Cincinnati, Sept. 11.—Connellsville, Wise County and Pocahontas foundry coke for first half shipment is quoted all the way from $11 to $12.50 at ovens, and spot prices range from $12.50 to $14.50. New River foundry coke is around $12.50 to $13 on contract and from $13.50 to $15.50 for prompt shipment. Furnace coke is not in demand for either prompt or future shipment, and few quotations are being made.

Inquiry is Brisk

St. Louis, Sept. 11.—The market for coke, both fuel and foundry, was active last week. The demand is quite brisk and, in an abnormally wide

range prices were strong. There is a scarcity of supplies, and even users well covered with contracts are in the market for additional small lots. As high as $17.95, St. Louis, was paid for odd carloads, while transactions as low as $15.95 were reported. Contract deliveries are not up to recent levels. The car supply is ample, but there are numerous complaints of the labor situation at points of production. Dealers report inquiries for liberal tonnages during the past week, especially from the southwest. Smelters in Arizona and New Mexico are in the market for fair quantities, and inquiries from Mexico, involving about 1800 tons, have been received here since Sept. 1. A better demand is also noted in the Missouri lead district.

Steady Coke Output in South

Birmingham, Ala., Sept. 11.—The labor situation in the coal mining section of the state has improved, following a stormy convention of the United Mine Workers of America the past week, at which the miners agreed to seek government assistance in settling differences. The coke producers are again busy and the output is steady. Producers are not willing to talk new contracts. Quotations are around $12.50 a ton, foundry coke, $8 to $10 on furnace coke, though coke is being delivered on long contracts under this price. Some delay in coke deliveries has been in evidence. Local consumption of coke shows no change. The Birmingham Trussville Iron Co. will be making coke in the next few days. Shipments of coke, for exportation to Mexican smelting plants, are still being made from this district through Laredo, Tex.

Alabama coal operators have had a strong delegation in Washington in conference with Dr. H. A. Garfield, coal director, seeking a revision of the schedule of prices recently announced by the President. It is claimed that in many instances operations cannot be maintained if coal has to be sold at the prices fixed.

Spiegel in Better Demand

One Buyer Wants 4000 Tons in Next Four Months—Domestic Ferro Brings $400 for Spot Shipment

New York, Sept. 11.—Although most sellers of ferromanganese recently have been inclined to ask higher prices, the small volume of buying prevents any definite tendency in this direction and the little business that is moving is being done at the old figures. Several moderate-sized tonnages of domestic ferromanganese have been sold during the week at $400, delivered, for spot and at around $385, and as low as $375 for shipment over the remainder of the year. No business has come out of late to test the market on first half, but it is certain that $350, delivered, could be done without difficulty on this position. Pending inquiry is of very moderate proportions.

Spiegeleisen again is more active. Inquiries now before the trade call for approximately 5000 tons. Most of this is wanted by a Cleveland district consumer who wants 4000 tons for delivery over the last four months of this year, at the rate of 1000 tons monthly. Sales of moderate tonnages again have been made during the week at around $80 to $82.50, furnace, for 18 to 20 per cent metal for this year. No interest has been shown in more distant requirements, but first half of 1918 could be had without difficulty at $75, furnace, and probably lower.

In 50 per cent ferrosilicon, the situation continues featureless. Metal for spot shipment may be quoted at around $225, delivered, and close to this price undoubtedly would have to be paid for shipment over the rest of this year, since the output over this period is practically sold up. For first half of 1918 there is a lack of inquiry to test out the market and this position may be quoted nominally at $140 to $150, delivered.

Alloy Consumers Wait

Pittsburgh, Sept. 11.—No new buying of consequence is being made by consumers of ferroalloys. They are fairly well covered and those who are buying come into the market only for requirements to meet their immediate needs. Their hesitancy is attributed to the forthcoming price-fixing policy of the government, which apparently they think will result in lower prices for alloys. While producers are well booked with tonnages, some of them are actively seeking new business and one made an unsuccessful effort to dispose of a small tonnage of 80 per cent ferromanganese for prompt shipment at $400 a ton, furnace. For the first quarter, 80 per cent ferromanganese is quoted at $375 and for the first half at $350. Twenty per cent spiegeleisen for last half is quoted at $80 to $82.50 and for the first half at $74 to $76; 9 to 10 per cent bessemer ferrosilicon at $94; 10 to 11 per cent, $95; 11 to 12 per cent, $97.50; 12 to 13 per cent, $100, and 13 to 14 per cent, $105 per ton at Ashland, Ky., Jackson and New Straitsville.

Sheet Bars Quiet

Sellers and Buyers Display Diffident Attitude Pending Government Program

Pittsburgh, Sept. 11.—Quietness continues to rule in the market for billets and sheet bars. Both sellers and buyers are showing a lack of interest in these products and renewed activity in the market is not expected to develop until after the government has announced its price-fixing program. Sales of small lots of 4 x 4 bessemer billets at $75, Pittsburgh, have been made. Slabs are commanding about $5 a ton over that figure. Virtually nothing has been done in selling sheet bars. While it is believed that no difficulty would be experienced in obtaining sheet bars at $85, some brokers in this district are asking from $85 to $90, Pittsburgh. The government is inquiring for some fair-sized lots of forging billets, which continue to be quoted at $125 a ton, Pittsburgh, in the open market. A buyer who asked for 1000 tons of these billets offered a broker $120 a ton for them, but the broker refused to sell at this figure. An inquiry for a small lot of discarded shell steel is also out and it is understood the prospective buyer was given a quotation of $55.

Sells for Last Quarter

Youngstown, O., Sept. 12.—One sheet bar producer in the valley has signified the opening of his books for fourth quarter business by disposing of fair-sized tonnages of bessemer sheet bars. The figure quoted to established customers was $90, mill. This concern states that its rolling schedule is now tight for the first month and a half of the quarter.

Fourth More of Freight

Railroads of the United States increased their ton-miles of freight hauled 25.7 per cent in June this year over the corresponding month a year ago, according to the current report of the railroad's war board. The freight handled in the month this year was equivalent to hauling 19,676,463,348 tons one mile. This figure is for approximately half of the railroad mileage of the country, or the roads on which reports were available when the tabulation was made. This increase was made in the face of an increase in car equipment of only 3 per cent.

Bar Specifications Heavy

New Business Restricted But Government Needs Are Growing —Production Retarded—12,000 Tons Sold at 4.50c

Pittsburgh, Sept. 11.—Specifications against contracts for steel bars continue to be heavy. New business for private consumption is limited. Large lots will be required for the pending government order for 10,000 cars for shipment to France. Mills are well booked with contracts and those of the leading interest are extremely busy with government orders and are handicapped by reason of the fact that production has been curtailed on account of coal shortage and a diversion of capacity to plate production for the government. Small sales of soft steel bars by independent mills at 4.25c to 4.50c, Pittsburgh, for prompt shipment are reported. Reinforcing bars are being sold in limited lots at from 3.50c to 4c. Demand is being made for prompt shipments and where it comes from private buyers the bars are principally for use in the construction of buildings.

Steel Bars at 4.69c, Chicago

Chicago, Sept. 11.—An eastern independent is selling carload lots of soft steel bars at 4.69c, Chicago. This interest is not making contracts and has only small lots available from time to time. The leading independent has sold considerable tonnages recently for prompt delivery at 4.69c, Chicago. This selling has been confined to rounds and is made possible by new mill capacity just coming into service. No contracts are being made beyond the end of the present year.

Hard steel bars rerolled from rails are firm at the prevailing quotation with light inquiry and comparatively few sales. The season for concrete work is drawing to a close and no further business from that source is to be expected during this year. Other users are taking some material, but the market is not active.

Bar iron continues at 4.50c to 5c, Chicago mill, with buyers asking for little, and sellers willing to let the market rest.

Bars for Export

New York, Sept. 11.—Export sales have comprised practically all the activity in the steel bar market in this district during the past week. Such transactions included 1000 tons of high carbon bars for Italy at 4.25c, Pittsburgh, approximately 400 tons of soft steel bars for Japan at 4.75c, Pittsburgh, and other tonnages. A number of export inquiries involving tonnages of similar size, are under negotiation. Some domestic consumers have placed their fourth quarter requirements recently at prices ranging from 4c to 4.25c, Pittsburgh, and domestic demand now is comprised almost entirely of small lots for prompt and nearby shipment and these are being obtained at all the way from 4c to 5c, Pittsburgh, the lower price being done by second sellers. In some cases, even higher than 5c has been obtained for small lots.

Buy Bars Easier

Philadelphia, Sept. 10.—Scarcity of steel has not been so marked in the bar market lately as in plates and shapes, with the result that consumers have had less difficulty in placing their forward bar requirements. This business has gone at varying prices. Soft bars for shipment over the last quarter and first quarter have gone in good-sized tonnages at 4c and 4.25c, Pittsburgh, equivalent to 4.185c and 4.435c, Philadelphia, while some smaller tonnages have gone as high as 4.50c. On the other hand, small lots of medium steel bars for prompt shipment have gone at all the way up to 6c, Pittsburgh. Consumers working on contracts for the government have in a number of cases lately obtained good sized tonnages of bars for this work at 3.50c, Pittsburgh.

Canada Wants Big Tonnage

Buffalo, Sept. 11.—Canadian car companies are making inquiries in this district for 60,000 tons of bars, shapes and plates, in connection with Dominion government contracts for cars to be used on Canadian railroads.

Sells 12,000 Tons

Youngstown, O., Sept. 12.—One leading maker has disposed of one lot of steel bars at 4.50c, mill. The order recorded was for 12,000 tons and was filled for last quarter business.

Nuts, Bolts and Rivets

Pittsburgh, Sept. 11.—Mills making rivets are being urged to make early shipments to buyers who are specifying heavily against contracts and are as a general thing engaged in government work. The demand for domestic consumption is extremely limited. Structural rivets continue to be quoted at 5.25c, Pittsburgh, and cone head boiler rivets at 5.35c, Pittsburgh, for the remainder of the year. The market for nuts and bolts is quiet so far as new business is concerned and prices remain unchanged.

Hoops and Bands

Pittsburgh, Sept. 11.—Limited lots of hoops and bands for prompt shipment have been sold at 5c to 6c for hoops and 5.25c to 6c for bands, mills. No inquiries of importance have been put out during the past week.

Open Books for Shafting

Pittsburgh, Sept. 11.—Small tonnages of shafting have been sold this week to screw and automobile makers for last quarter delivery by a large independent producer in this district, who has just opened books for business during that period. Prices are quoted at 5 per cent off the list to list, Pittsburgh. The government has taken 400 tons of shafting for prompt delivery for navy yards. While mills are well booked with orders, particularly those placed by the government, producers are in a position to supply limited tonnages to private consumers for prompt and last quarter deliveries. These contracts are subject to those that may be placed by the government, which are given priority.

Specify for Strip Steel

Pittsburgh, Sept. 11 — Specifications against contracts for sizeable tonnages of cold-rolled strip steel are being made by consumers, many of whom are engaged in government work. Private buying is almost at a standstill and some consumers are reported to be holding up shipments, awaiting announcement by the government of its price-fixing policy. Although producers have expressed the feeling that cancellations of contracts will become more or less general, so far there has been but little of this reported.

Will Make Shells

The Jeanesville Iron Works, Hazelton, Pa., will begin work on filling an order for 5,000,000 shells for the United States government as soon as the necessary alteration in its machinery have been completed. The plant is to be extended by the erection of a number of large new buildings. About six months ago the company suspended several hundred men owing to the expiration of its shell contracts with the Russian government but it expects to begin enlarging its present force shortly.

U. S. Wants More Plates

Federal Requirements of Ship Steel Grow Heavier—Some Mills Have Full Capacity Taken by Government—Coal Scarce

Philadelphia, Sept. 10.—Exceedingly heavy tonnages of ship plates have been distributed among eastern mills by the government during the past week. One leading eastern Pennsylvania maker alone received a portion of this business which will take up its entire capacity for a period of two months. To such an extent has this business grown of late that one of the largest eastern makers states that practically 100 per cent of its output now is going to the government, either directly or indirectly An interesting feature of the ship steel business now being placed by the government is that while no price, either provisional or final, yet has been set, the mills in order that they may handle this business in their books in the usual way, will bill the government at such prices as seem fair to them. In the meantime the government will fix a price as soon as possible and when this is arrived at there will be an adjustment.

A crisis has been precipitated at eastern plate as well as other steel mills, due to the shortage of coal, particularly gas coal. One mill last Saturday had only enough gas coal on hand to enable it to complete its last week's schedule. Cessation of operations today was averted by the receipt of sufficient coal over Sunday to last for little more than a day, so that unless another shipment is received within the next 12 hours, a shut-down will be necessary. The condition at this mill is typical of that prevailing at a large number of plants.

Mills report that requests for prices and deliveries on plates continue without abatement. Quotations on new business are almost uniform at 10c, Pittsburgh, or 10.185c, Philadelphia, for shipment at mills' convenience, and with the understanding that the government is to be served first. Mills say that this impossibility of guaranteeing deliveries prevents the taking of orders from regular customers who would be glad to pay 10c, Pittsburgh.

Japan Seeks Plates

New York, Sept. 11.—Despite the rigid export embargo, numerous foreign inquiries for plates continue to be put out in this market. These are designated for shipment to practically all parts of the globe, including South Africa, Italy, South America, Australia, and other countries, but in most cases the mills who are asked to quote, believe that they are intended for Japan. As no assurance with regard to export permits accompanies these inquiries, the mills pay no attention to them. Most of these inquiries involve 1000 to 2000 tons each.

Quiet at Pittsburgh

Pittsburgh, Sept. 11.—Although the government came into the market about two weeks ago for 10,000 additional steel freight cars for railroads in France, it has not made any purchases for this lot. It is believed that the government is withholding buying until it can find the necessary shipping tonnage for transporting the cars abroad. Domestic buying of plates is extremely limited. Consumers are waiting on the government to announce prices. Mills are well booked with contracts as a general rule, although some of the independents are quoting rather freely. While small lots have been sold in this district for private consumption during the past week at 9c, Pittsburgh, for prompt shipment, offerings continue to be made at 8c, Pittsburgh, which is considered to be most nearly representative of the market. Even this latter figure, it is reported, may be shaded in some instances. Requirements of the government in connection with its shipbuilding program are being placed and one order for 27,000 tons was given some time ago to a large independent producer in this district for shipment to a concern on the Pacific coast, which is to build ships for the Emeregency Fleet Corp.

The fact that the government has asked producers of plates, shapes and bars for additional figures regarding the cost of production has led to the belief that the price-fixing program has been further delayed. Some of the manufacturers have already supplied these supplementary data.

Little Plate Selling

Chicago, Sept. 11.—Dullness marks the market for steel plates. Demand continues, but makers have little tonnages to offer for anything like prompt delivery. Some decline in demand has been felt, attributed to the expectation that steel prices will be regulated by the government shortly. An eastern independent has quoted 10.19c, Chicago, recently, but has not made sales at this figure. It appears that some makers have been willing to take prompt tonnages somewhat under this figure.

Navy Seeks More Sheets

New Destroyer Program Will Require About 7000 Tons Additional—Daniels Wants Lower Price

Pittsburgh, Sept. 11. — Enormously enlarging its program for the building of torpedo boat destroyers, the navy department has again come into the market for about 7000 additional tons of sheets. Requirements are also being placed for mines, ranges and airplanes. Fair-sized inquiries for sheets for export are also pending. Independent mills are taking small tonnages for domestic consumption. Contracts being placed by the navy department name tentative figures, which are subject to readjustment based upon findings of the federal trade commission. While the war department is understood to be paying 6.50c, Pittsburgh, for No. 28 black sheets, Secretary of the Navy Daniels is reported to have refused to meet this level and to have named a provisional figure of about 2 cents per pound less. The open market for No. 10 gage blue annealed sheets continues to be quoted at 8.50c to 9c; for No. 28 black sheets, 9c to 9.50c; and for No. 28 galvanized sheets, at 10.25c to 11.50c, Pittsburgh. In general little change has been observed in prices.

Expect Government Orders

Youngstown, O., Sept. 12.—Many inquiries indirectly from Washington calling for large tonnages of sheets are coming out in the Mahoning valley district. While no tonnages have been placed yet, the inquiries are considered as forerunners of another large buying program about to be launched from Washington. One inquiry alone was for 11,000 tons of black sheets, No. 28 gage. This inquiry came from a fabricator working in conjunction with Washington. No fixed price was intimated, this being left in the hands of the producer. It is understood the figure quoted was 6.50c, mill.

The majority of sheetmakers are sold up for the fourth quarter. Contracts were based on current prices, namely, blue annealed, No. 10 gage, 8.50c to 9c; black, No. 28 gage, 9c to

9.50c; and galvanized, No. 28 gage, 10.25c to 11.50c.

Sheet Demand Good

Chicago, Sept. 11.—Demand for all grades of steel sheets continues excellent, with prices well sustained. On No. 28 gage black, the prevailing quotation is 8.94c to 9.19c; on No. 10 gage blue annealed, 8.69c to 8.94c, and on No. 10 gage galvanized, 10.19c to 11.19c, delivered, Chicago.

Sell From Stock

Some Tin Plate Mills Have Disposed of Small Tonnages

Pittsburgh, Sept. 11.—Limited tonnages of tin plate for domestic consumption have been sold from stock. Mills are so heavily booked that they are not able to take any sizeable orders. Requirements of the government are so enormous that they require capacity operations by producers and as a result private buyers are not able to get material for early deliveries direct from the mills. The embargo recently declared by the government against export shipments of tin plate has had no appreciable effect on the market. Nothing has been done by the food administration with regard to fixing prices for tin plate or with the proposal of Administrator Herbert C. Hoover that manufacturers sell canners tin plate for the entire year of 1918. The manufacturers are awaiting action by Mr. Hoover before proceeding further with these questions which they discussed at their recent meeting in this city. The price of tin plate to be used in connection with the food program is largely dependent upon the levels that will have to be paid for sheet bars for next year. Denial has been made of the report that books of manufacturers will be closed to jobbers after Oct. 1. Reports which lack verification have been heard that provided sheet bars can be obtained at probably $60 a ton, the price of tin plate will be fixed at from $7.50 to $8.25 per 100 pounds, Pittsburgh. Limited sales that have been made to private consumers were on a basis of from $12.50 to $15, Pittsburgh.

The plant of the Standard Fuse Corp., Paulsboro, N. J., which has been closed since April 1, when contracts for fuses for the Russian government expired, is about to resume operations for the manufacture of ordnance primers for which the company has a large contract. In addition, airplane parts will be made. Several acres adjoining the plant have been purchased and large additional buildings are to be erected.

Scrap Shipments Held Up

Railroad Embargoes Restrict Movement in All Parts of Country —Little Buying Being Done—Prices Drop at Some Centers

COMPLETE SCRAP PRICES ON PAGE 568

New York, Sept. 11.—The embargo on scrap shipments from all points to all points on the Pennsylvania railroad at present is the bane of the eastern scrap dealer's existence. Although machinery some time ago was provided by the railroad for the granting of permits for scrap shipment to the less congested points, the formality attendant upon the granting of such licenses makes quick action impossible. Dealers, therefore, despite their best efforts, are unable to ship more than about 50 per cent of the deliveries which are required on contracts. It is presumed that there will be little change in the present situation until the eastern mills find themselves in need of scrap, and become forced to exert pressure both on the government and on railroad authorities with the object of hastening shipments. Buying by consumers is on a hand to mouth basis and is of very little proportions in the aggregate. On the other hand, difficulty in making shipments puts dealers in an independent position, with the result that they find it easy to buy at concessions, particularly on the foundry grades. No. 1 heavy cast now is quoted by the dealers at $32 to $33 at New Jersey points, No. 1 machinery cast at $34 to $35 and stove plate, $20 to $20.50.

Eastern Market Dull

Philadelphia, Sept. 10.—Buying of steel and iron scrap in this district again has been restricted to trading between dealers. Even this business is at a minimum. Despite the recent dullness, the market is well maintained and dealers are compelled to pay full prices to get material for delivery on contracts. The only declines of the week have been in heavy melting steel and wrought pipe. The former declined $1 and the latter $1.50. Rejections continue numerous.

More Embargoes on Scrap

Pittsburgh, Sept. 11.—Tightening of the railroad embargo situation is in prospect for scrap dealers and will add to their already perplexed condition. Dealers have been advised that within a week's time they will be compelled to first obtain a permit from virtually all railroads for the movement of each car. This is the policy that is now in effect on the lines of the Pennsylvania railroad and the New York Central lines have extended their embargo so that it applies east and west. The market is extremely dull, but heavy buying is expected to develop after the government has announced its price-fixing policy, provided the embargoes will make this possible. The stocks of most consumers are reported to be almost exhausted and it is believed they will be forced to enter the market in the near future. Limited lots of heavy melting steel have been sold in this district during the past few days on a basis of $35 to $36, Pittsburgh. Small tonnages of low phosphorus scrap have also been sold at from $48 to $49, Pittsburgh. It is reported that one consumer is about to put out an inquiry for a large tonnage of heavy melting material.

Shipping Permits Required

Cleveland, Sept. 11.—The difficulties of scrap shippers in this district have been increased by an order from the New York Central lines west of Buffalo and Clearfield, Pa., to the effect that a permit must be procured for every car. The Cleveland freight office of the railroad has transmitted to all scrap shippers over its lines copies of the following circular by the commission on car service: "With reference to the very serious delay to cars used in handling shipments of scrap iron, it is our opinion that the railroads should control the use of cars in this service by a liberal use of embargo and that no shipments should be accepted or cars furnished therefore until satisfactory evidence has been given to the originating line that prompt disposition will be made on arrival at destination. This can be handled through the 'permit system' and in that way we feel will eliminate a very serious misuse of equipment."

No buying of importance has as yet developed in this district. The market is spotty and rather weak. Heavy melting steel is quoted at $33 to $34 a gross ton; machine shop turnings, $18 to $18.50 a net ton; cast borings, $18 to $19 a net ton.

Prices Sag at Buffalo

Buffalo, Sept. 11.—Little business of importance developed during the past week, and in consequence the market sagged on certain grades of scrap. Heavy melting steel dropped to $31.50 to $32; low phosphorus steel to $41 to $42. There has been no business in this commodity for the past two

or three weeks. Railroad wrought fell to $43 to $44; No. 1 railroad and machine turnings to $30 to $31; iron axles to $45 to $47; steel axles to $45 to $47; railroad malleable to $32 to $33; and wrought pipe to $28 to $29.

Consumers are patiently awaiting government action, and are refraining from purchasing. Another feature which combines to retard the market is the fact that for shipment to all points, it is necessary to secure a shipping permit. A general embargo, in effect on the Pennsylvania and Erie railroads, on all shipments of scrap, makes it necessary to secure a permit to have the embargo modified. This is issued solely on the assurance of consignees that the cars can and will be unloaded promptly.

Chicago Scrap Waits

Chicago, Sept. 11.—Aside from the purchase of 10,000 to 15,000 tons of heavy melting steel by the leading independent steelmaker, the market has been without feature for some time. This tonnage, it is understood, was contracted at $31 to $34 per ton. Other consumers appear to have sufficient scrap on hand to last for some time, and many are waiting for a decision on prices of steel before taking more material. Prices are fairly steady, with a few items advanced $1 to $2 per ton and slight declines being marked in other cases.

Railroad offerings are light, the North-Western railroad offering 2500 tons; the Chicago, Milwaukee & St. Paul railroad, 1500 tons; the Union Pacific railroad, 1700 tons; the Wabash railroad, 950 tons; and the Chicago, St. Paul, Minneapolis & Omaha railroad, 350 tons.

Prices Fall at Cincinnati

Cincinnati, Sept. 11.—Prices have taken a tumble. No. 1 yard wrought is weak at $26 per gross ton, and No. 1 machine cast is now $23 per net ton. Transactions are rare. On account of the difference in cost, as compared with pig iron, foundries are using an increasing quantity of scrap in their mixtures. However, they are not inclined to contract ahead and are only buying sufficient to run them through a period of 30 days at the most. Purchases on the part of the steel mills have fallen off, and these mills are making strenuous efforts to get scrap due them on old contracts. Malleable scrap is weak and no demand for it is reported from any source.

Quotations Marked Up

St. Louis, Sept. 11.—The market for iron and steel scrap is strong, with all quotation changes during the past week being sharply upward. Nearly all grades are being held from $1 to $2 higher, and old car wheels are up about $4. While the demand is not brisk, the market shows signs of waking up. Consumers, many of whom have allowed their reserves to dwindle, are now inquiring quietly for tonnages. Dealers, however, are not anxious to sell heavily in the present uncertain and erratic market. This is especially true where they have to go short.

Receipts of country scrap continue extremely light and offerings by the carriers are also at a minimum. There has been little accumulation, while consumption has continued heavy. Relaying rails are a strong spot. The supply of this grade is small, and dealers with any on hand are asking fancy prices.

The only railroad offerings before the market this week were as follows: Cleveland, Cincinnati, Chicago & St. Louis railroad, 2500 tons; Mobile & Ohio railroad, 800 tons; Kansas City Southern railroad, 350 tons; and one or two small open lists by local roads.

Improves in South

Birmingham, Ala., Sept. 11.—Continued though slight improvement marks the southern iron and steel scrap market. Several changes in prices have resulted. Plenty of stock is still on hand and some inquiries are being received. No. 1 wrought advanced $1, while stove plate is up $2. Heavy melting steel is firm and has alvanced. Melters who have contracted with dealers are asking for delivery now. There is still much ground to be recovered before the scrap business is back to the conditions which prevailed a couple of months ago.

Buildings For Government

Washington Officials Will Want 25,000 Tons for Military Structures in France—Distribute Orders for Domestic Buildings

New York, Sept. 11.—At least 25,000 tons of steel are wanted by our government for erecting military buildings in France. These structures include 100 buildings to be used as troop quarters, each involving approximately 100 tons of steel, and 37 ammunition buildings, each 400 to 430 tons. About half of the buildings for troop quarters already have been let to fabricators who have the required material in stock and the remainder, as well as the 37 ammunition buildings, will be let without delay. This business is being distributed by the Stone & Webster Engineering Corp., 120 Broadway. Other structural requirements in connection with our military operations in France are expected to come up for action shortly.

100 Buildings in U. S.

Philadelphia, Sept. 10.—Contracts for approximately 50 buildings, involving each 80 to 100 tons of steel, or a total of 4000 to 5000 tons, were placed by the government during the past week. This business was divided up among fabricators according to their ability to make quick shipments. The total requirements were 100 buildings, to be located in various parts of the country, and those not yet placed are expected to be distributed shortly.

Outside of this business the shape market has been dull in the east during the past week. A few small tonnages, constituting an inconsiderable total, were placed in connection with industrial plant extensions.

Prices on plain shapes as quoted by the mills in no case appear to have been less than 4.50c, Pittsburgh, or 4.685c, Philadelphia, of late, while sales of small tonnages again have been made at 5c, Pittsburgh, and in exceptional cases even higher has been done.

Operate on Old Contracts

Pittsburgh, Sept. 11.—No new business for fabricating shops has developed during the past week. They are kept busy on government contracts and are about to take additional requirements from the government in connection with the three steel shipyards it is to build, and with the program of the Emergency Fleet Corp. In some instances where contracts are placed by domestic consumers, fabricators are unable to promise definite periods of delivery. Beams are being quoted at 4c to 5c, Pittsburgh.

Structural Demand Light

Chicago, Sept. 11.—As far as can be determined, no business in structurals involving more than 100 tons has been placed in the west during the past week. Dull conditions have existed for so long that most structural shops in Chicago are operating at about half capacity, and on small contracts rather than large. At Milwaukee, fabricators are much busier on material to be used locally. The Chicago shops of the American Bridge Co. have undertaken recently to fab-

ricate part of 5000 tons for a gun shop to be built by the government in the east. Plain material is not in much demand under these circumstances, which is pleasing to mills, as most mills are sold through the remainder of the year.

CONTRACTS AWARDED

Three additions to plant of Willys-Morrow Co., Elmira, N. Y., 500 tons to independent fabricators.

An addition for United States Cast Iron Pipe & Foundry Co., Burlington, N. J., 200 tons, to an independent fabricator.

Pier at Brooklyn, for William R. Grace & Co., 500 tons to the Bethlehem Steel Bridge Company.

One hundred bridges for Belgium, each 43½ feet long, to McClintic-Marshall Co.

CONTRACTS PENDING

Addition to the Watertown arsenal, 1400 tons, bids being taken.

Thirty-seven United States ammunition buildings for erection in France, 400 to 430 tons. Bids being taken by Stone & Webster, Engineering Corp.

One hundred buildings for United States troop quarters in France, each 100 tons, bids being taken. About 50 already placed and the remainder to be placed without delay, by Stone & Webster Engineering Corp.

One hundred ammunition sheds to be built by the United States government in France, involving 80 tons each, bids being taken.

Car Buying

Slackens Following Federal Purchases —Further Orders Expected

Chicago, Sept. 11.—Since the United States government placed its large car orders for railroads in France, practically no activity has been witnessed in the American car market. A further purchase of 10,000 cars for use in France has not materialized definitely. The Virginian railway is negotiating for 1000 steel hoppers of 55-ton capacity. The Southern railroad has asked prices on 400 freight cars and the Seaboard Air Line on 500 flat cars. Standard rails and fastenings are not active, but considerable buying of light rails is being done for industrial use.

Rail Mills Busy on U. S. Work

Pittsburgh, Sept. 11.—Mills continue to operate heavily on government orders for standard rails for shipment to France. Large producers are well filled with contracts for both light and standard sections for the remainder of the year, some of the tonnage being for private consumption. Domestic business is extremely quiet. The government is buying freely of spikes and track bolts. Small tonnages of spikes for prompt delivery are being sold in this district to jobbers at 7c, base. Boat builders engaged on government contracts, especially large consumers of spikes, are expected again to come into the market for increased requirements in connection with the new building program of the Emergency Fleet corporation. The railroads are also expected to enter the market in the near future.

Model City

Will be Started by Mark Mfg. Co., at East Chicago, Ind.

Chicago, Sept. 8.—A model city to accommodate 8000 employes is being laid out and construction started at East Chicago, Ind., by the Mark Mfg. Co., which is erecting a large steel plant at Indiana Harbor. A site containing 190 acres has been bought and plans are being prepared by Howard Shaw, architect, to include the best features of similar housing efforts in other industrial communities. A park, 280 x 350 feet, will form the central square with business structures surrounding it. Street car lines from East Chicago and Whiting to Indiana Harbor will traverse the two principal streets. Work has been started on 200 modern houses of four to seven rooms, costing $2500 to $4000 each. They are of tile and of slow burning type.

Lots are 48 x 50 feet, giving garden space beside each house. Houses will be built at the lot line with a public lawn between the houses and the sidewalk and street. Boarding houses and club houses for unmarried men will be provided. First class schools will be established. A recreation building for general use will be built. One end of the tract has been reserved for higher paid officials where more pretentious homes will be built.

A sale plan has been devised by which employes may buy their homes over a period of five years. At the end of that time if they remain in the employ of the company a generous rebate on the price will be given as a bonus. Space is provided for about 8000 persons on this tract. An initial investment of $1,000,000 will be made in buildings.

Great Strides

Made by Youngstown District in Iron and Steel—Rivals Pittsburgh

Importance of the Youngstown district as an iron and steel producer is given official recognition in the annual statistical report of the American Iron and Steel Institute for 1916. This is the first time Youngstown district has been given a distinct classification. The district is defined as including Mahoning, Trumbull and the northern part of Columbiana counties in Ohio, and Mercer, Lawrence and Beaver counties in Pennsylvania.

This territory embraces a greater production than any other part of the country excepting only Allegheny county. The output of pig iron in the Youngstown district in 1916 was 6,923,938 tons of steel; 7,132,681 tons of steel including 4,042,347 tons of open hearth, 3,115,184 tons of bessemer and 25,150 of other kinds; and 3,765,389 tons of roll products. There were 49 blast furnaces on the active list in the district in 1916 and one since has been built by the Republic Iron & Steel Co. The Pittsburgh district with 47 blast furnaces produced 305,975 tons more pig iron. The number of rolling mills and steel works in the Youngstown district is given as 42 against 60 in Pittsburgh territory. Two new finishing mills, including the Carnegie works at McDonald, which will produce about 50,000 tons monthly, are under construction in the former territory.

A summary of the 1916 statistics shows that the Youngstown district has been increasing its iron and steel production at a larger rate than its principal rival. Its gain in pig iron in 1916 over the preceding year was 25.5 per cent against 22 per cent for Pittsburgh, and in steeel ingot production 23.5 per cent against 19.7 per cent for Pittsburgh.

New Clause

In Contracts to Meet Stipulations of Child Labor Law

Philadelphia, Sept. 10.—A new clause is being added to all new contracts for materials in order that the buyer may be assured that such materials were made in accordance with the provisions of the new national child labor law. The Midvale Steel Co. and its associated companies have specified that the following guaranty hereafter must appear on all invoices rendered for material for their account:

"The undersigned hereby guarantees that the goods listed herein were manufactured or produced in a mill, factory or manufacturing establishment, in which within 30 days prior to the removal of such goods therefrom no children under the age of 14 years were employed or permitted to work, nor children between the ages of 14 and 16 years employed or permitted to work more than eight hours in any day or more than six days in any week, or after the hour of seven o'clock postmeridian or before the hour of six o'clock antemeridian."

Mills Face Coal Shortage

Some Eastern Plants Close as Receipts of Gas Coal Dwindle —Users Seek Modification of Lake Order

Philadelphia, Sept. 10.—Eastern Pennsylvania's iron and steel industry now is at the mercy of a coal shortage which has been serious enough for some time past and now has reached the acute stage. Numerous mills, some of which are devoting practically 100 per cent of their capacity to government work, are on the verge of shutting down.

Several of the largest mills for a number of days past have been entirely dependent on their day to day receipts and few of them now have enough coal on hand to last them more than a day or two.

Although steam coal is scarce, the particular famine is in gas coal. This is being shipped to the northwest in accordance with the government's instructions that 26,000,000 tons of this grade must be moved to that section before the close of navigation on the lakes.

As a result of earnest protestations of the large gas coal users, Dr. Garfield has appointed a committee which is expected to supervise and insure sufficient deliveries of gas coal to such plants as are working on government orders. Other users cannot be taken care of in the present juncture and it appears there is nothing for them to do but shut down their plants. This, some of them already have done.

Much discussion is heard as to whether or not the government will consider it expedient to reconsider the $2 price which it recently fixed on coal. The effect of this price already has been witnessed in curtailed production at some mines and in the expected closing down of many of them in the near future. It practically is impossible to buy any coal at the government price, the mines restricting themselves to making shipments on old contracts.

Small Tonnages of Wire Rods Sold

Pittsburgh, Sept. 11.—Limited tonnages of wire rods have been sold by an independent producer in this district to private consumers on a basis or $90 to $95, Pittsburgh, for prompt delivery. Small lots of wire nails of various sizes have also been taken for nearby delivery. Coated nails are commanding 4c, Pittsburgh, and cut nails, 4.50c, Pittsburgh. The leading interest continues to remain out of the market for wire products, being booked with heavy requirements for the government.

Wire Market Broader

Chicago, Sept. 11.—After a considerable period during which no contracts were made, it is understood contracts have been placed recently for manufacturers' wire for fourth quarter delivery on a basis of $3.20 for nails. Independent manufacturers of wire and nails have continued to hold their price at $4 for nails.

Cast Pipe Demand Light

Chicago, Sept. 11.—Practically nothing but routine orders are being taken by cast-iron pipe makers in the west. Not a single municipal letting is in prospect and no formal negotiations were current last week. Contractors and industrial concerns making extensions continue to take some pipe, but the aggregate of this business is not large. Some reluctance on the part of buyers is attributed to expectations that price regulation of bars and pig iron may bring a reduced price.

Light Demand for Pipe

Pittsburgh, Sept. 11.—Only slight demand exists for iron and steel pipe. Most jobbers are well supplied and some are staying out of the market until trade conditions become more certain than they now are. Inquiries for small tonnages of butt and lap weld pipe are said to be pending, but mills are not showing much interest because they are well booked for the remainder of the year. Gas and oil producers, it is believed, will come into the market for sizeable tonnages in the near future. It is reported that jobbers are contemplating a reduction in prices to a figure at or near to the levels of the current card of the National Tube Co.

Heavy Inquiries

Youngstown, O., Sept. 12.—Governmental business still dominates the pipe market in this district. Inquiries for various kinds of pipe are strong and an especially large volume of business is now being done for lap-welded pipe to be used at the army cantonments.

Melt in South Steady

Birmingham, Ala., Sept. 11.—Cast iron pipe plants in the south are melting iron steadily and are moving out pipe as quickly as cars can be got and the pipe inspected. No big business has been reported lately. The prices are still around $60 and $63 a ton for 4 and 6-inch pipe. A few municipal orders have been received. The United States Cast Iron Pipe & Foundry Co. still has much of the Argentine order to deliver, transportation facilities not being sufficient.

1000 Tons for U. S. Camp

Orders which have been placed by the government for cast iron pipe to be installed at the new debarkation camp at Tenafly, N. J., total 1000 tons. These requirements have been divided about equally between the United States Cast Iron Pipe & Foundry Co. and the Warren Foundry & Machine Co. Outside of this business actual buying is of small proportions. Private buying involves only a few small lots here and there. The only public letting in sight is a tonnage for Jersey City, N. J., on which bids are to be opened Sept. 25. Nothing further yet has developed with regard to the 3000 tons of cast iron pipe for Holland and several thousand tons for France, on which makers recently submitted quotations. Prices continue to be quoted at $65.50, New York, for 6 inch, Class B, and $68.50, New York, for 4-inch, Class B.

Warehouse Prices

Show no Reflection of Easier Tendency in Certain Other Lines

Philadelphia, Sept. 10.—Despite the easier tendency in prices on certain steel products as quoted by the mills, prices on shipment out of warehouse have reflected no shading in this district. The current level continues around 10c for plates, 5.20c for iron bars and 5c to 5.50c for shapes and steel bars, and on the latter prices average nearer the outside than the inside figure. Although the volume of business continues good, only small lots are wanted, as a rule, and the big single orders which only recently were offered to the warehouses now are a thing of the past.

Chicago Stores Depleted

Chicago, Sept. 11.—Chicago warehouses have not departed from quotations which have stood for several weeks. The divergence in prices on steel plates continues, most stores asking 10c, while one interest maintains a quotation of 7c. Inasmuch as supplies are short and sales are made only to regular customers, this has no particular market significance. Deliveries for mills are far short of demand and assortments in most lines are much depleted.

Scott Against Plant Commandeering

Chairman of War Industries Board Tells House Committee That Such Procedure Would Hamper the Government—Fair Contracts With Manufacturers Will Bring Better Results

WASHINGTON, Sept. 11.—The steel trade need have no fear that the government will commandeer plants for war purposes if the opinion of Chairman Scott of the war industries board can be taken. Mr. Scott in a hearing before the house appropriations committee declared that the cost of operating under commandeering conditions would be too high and that the government could get better results from fair contracts. He said, however, commandeering of finished products might work successfully.

This statement came in response to questions concerning contracts which Mr. Scott and the board approved by which the United States would buy for $9,500,000 the machinery used by the Remington Arms Co., the Winchester Repeating Arms Co. and the Remington-Arms Union-Metallic Cartridge Co., in manufacturing rifles for the British army. There were 16,000 in the deal and they had been appraised at $20,000,000, but the United States got them at half price under contracts which Chairman Fitzgerald of the house committee said were more in favor of the companies than the United States. The machinery is in plants of these companies and is owned by the government, but the companies own the buildings. The Remington Arms is making 475,000 rifles for the United States, the Winchester company is making 225,000 and the other Remington company 300,000. Secretary Baker, General Crozier, Mr. Scott and the war board approved the contracts by which the companies get costs and 10 per cent for manufacturing rifles with 6 per cent interest figured in as part of costs.

It was in defense of contracts which have been criticized that Mr. Scott made the statement that it would be unwise to commandeer plants for then the government would lose the organization which keeps the factories running and makes them really valuable. Mr. Scott's statement was, "I do not believe as a practical matter that the government has much of an opportunity to help itself by commandeering plants. I think that the process will result in most cases in higher cost than would be the result of fair contracts with manufacturers. If the government can find in existence articles it wants and can commandeer those ready for its purposes, then the commandeering proposition may work successfully, but I am confident that if what you need is the service of big manufacturing organization that you cannot commandeer that successfully."

Gregory's Opinion

Fails to Clear Up Right of Business Men to Aid U. S.

Attorney General Gregory's personal and informal opinion as to the meaning of section 3 of the food control bill, as disclosed in a letter to Chairman Scott of the war industries board, copies of which have been furnished chairmen of the subcommittees of the council of national defense, does not seem to assure the committee members that they really are exempt from the penalties imposed in the section. Attorneys representing some of the committemen have advised them the opinion only further complicates the situation and that in continuing to advise the government they are only further jeopardizing themselves.

Prefacing his opinion on questions submitted by Mr. Scott, Mr. Gregory says:

"While the attorney general is specifically authorized to give his official opinions on questions of law only to the President and the heads of the executive departments, I think, nevertheless, that under the circumstances I am warranted in answering your questions informally. I can only speak generally, however, and not with reference to any actual case, because none is before me."

This statement shows the opinion is not official and counsel of committeemen point out it would have little if any relief for anyone who might be prosecuted under the section. Even an official ruling, it is declared, would not necessarily affect a judge or a jury sitting on a specific case.

One steel man in Washington recently said: "The only relief in the situation lies in repealing the section."

The questions submitted by Mr. Scott and Mr. Gregory's answers follow:

Question 1: Is there compliance with the act where such interested person is a member of the war industries board and the board makes a recommendation to a contracting department or contracting officer with regard to such contract or order, and the interested person does not participate in making such recommendation?

Answer: No, not unless such interested person makes the disclosure required by the act. That he did not actually participate in the recommendation does not, in my opinion, relieve him of the duty of making the specified disclosure.

Q. 2: Is there compliance with the act where such interested person is a member of the purchasing commission of the war industries board and he makes a recommendation concerning such contract or order to the war industries board, making a full disclosure of his interest?

A: Yes.

Q. 3: Is there compliance with the act where such interested person is a member of the purchasing commission of the war industries board and makes a recommendation directly to a contracting officer or department concerning such contract or order, making full disclosure of his interest?

A: Yes; although in view of the narrow margin of difference which might exist in a given case between *recommending*, on the one hand, and *inducing, soliciting*, or *awarding*, on the other, it would be well as a practical matter for such persons to exercise great caution as to the kind of *recommendations* they shall make to a contracting officer.

Q. 4: Is there compliance with the act where such interested person, being a member of the subcommittee of the council of national defense, makes or participates in making a recommendation concerning a contract or order to the war industries board, or to a council, board or commission of the United States or any member thereof, but not to a contracting department or officer, and makes a full disclosure of his interest?

A: Unless I misunderstand it, I can see no difference in principle between this question and question 2, and therefore answer yes.

Q. 5: Is there compliance with the act where such an interested person is a member of the subcommittee and the subcommittee makes a recommendation concerning a contract to the war industries board, or to a council, board, or commission of the United States or any member thereof, but not to a contracting department or officer, and such subcommittee makes a full disclosure of the interest of the interested person?

A: No. The law requires the interested person himself to disclose his interest to the council, board, commission, or member or subordinate thereof to whom the recommendation is addressed.

Q. 6: Does the provision "Nor shall he (such interested person) participate in the awarding of such contract or giving such order" have the effect of nullifying the right to make recommendations to any council, board, or commission, when accompanied by a full and complete disclosure of interests?

A: In my opinion, no. There is an obvious distinction between actually *awarding* a contract or *giving* an order and *recommending* that a contract be made or an order given.

Prices Not Fixed

Navy Buys Coke Under Provisional Price Plan

Washington, Sept. 11.—Prices at which the navy has been buying coke for the past six weeks under contracts for 12 months are only tentative and subject to adjustment when coke prices are finally established by the government, according to Scott Stewart, secretary of the coke committee, a subsidiary of the coal committee of the council of national defense. These prices are $3.50 per ton for foundry coke at ovens and $3 for furnace fuel at ovens.

According to Mr. Stewart, the navy requires 15,000 tons annually, chiefly for its foundries in navy yards, and this tonnage has been distributed through the committee to bee-hive and by-product producers throughout the country at the above prices which, he says, amounts to practically an advance payment on each ton as the price may be finally fixed. The tentative rates signify nothing in the price-fixing policy, he declares, as none of the factors entering into production costs was considered when the producers agreed to take the coke allotments.

The coke committee was created July 9 and is headed by Roy A. Rainey, W. J. Rainey Co., chairman. Its members are: Scott Stewart, of the same company, secretary; Charles E. Lenhart, Producers Coke Co.; John M. Jameson, Jameson Coal & Coke Co.; J. D. Forrest, Citizens Gas Co.; W. H. Clingerman, H. C. Frick Co.; E. L. Pierce, Semet-Solvay Co.; C. L. Caldwell, By-Products Coke Corp.; and C. J. Ramsburgh, H. Koppers Co.

To Enlarge Steel Plant

The announcement that Newell C. Bradley has been elected vice president and works manager of the Eddystone Steel Co., Crum Lynne, Pa., marks the association of two young men of wide experience and large acquaintance in the high grade steel industry of the country.

Several months ago John E. Sullivan, who had been for some years a director and general sales manager of the Carpenter Steel Co. of Reading, Pa., purchased the plant formerly operated by the Crum Lynne Iron & Steel Co. at Crum Lynne, Pa., a suburb of Philadelphia, and adjoining the plants of the Baldwin Locomotive Works and the Remington Arms Co. at Eddystone, Pa., and has been operating it under the name of the Eddystone Steel Co. The equipment at present consists of one open-hearth furnace, one hammer, one 22-inch billet or bar mill and two 60-inch plate mills.

Mr. Bradley was connected with the Midvale Steel Co. for 18 years and had served in many capacities and departments. At the time he severed his connection with Midvale on Aug. 1 he was assistant superintendent of the Nicetown plant.

While no definite information is as yet available regarding the plans of the company, it is understood that new melting capacity is to be added soon, including one or two additional open-hearth furnaces, an electric furnace and auxiliary equipment.

Adds to Capacity

The Pangborn Corp. of Hagerstown, Md., manufacturer of sand-blast equipment, has purchased and taken over the sand blast department of the Curtis Pneumatic Machinery Co., St. Louis, which will enable it to greatly increase its line of sand-blast equipment.

Exploits New Process

Copper-Coated Steel to be Made by Seattle Concern

Lately incorporated in Washington with $100,000 capital, the United Copper Clad Steel Co., Seattle, plans to build a plant and equip it for the manufacture of a product made by welding copper to steel. The rust-resisting qualities of this product, it is said, will fit it for a wide variety of uses. Officers of the new company are: President and general manager, J. Archie Hess; vice president, H. O. Price; secretary, Pierce Lonergan; treasurer, C. E. Joselyn.

The Convertible Tractor Corp., Minneapolis, lately removed its offices from 510 Kasota building, Minneapolis, to its new plant, 1485-1489 Marshall avenue, St. Paul. Considerable equipment is being purchased but the company has not contracted for all of its new machinery.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Sept. 11.—The metal markets have experienced a reversal of sentiment the past week relative to the policy the government may adopt toward fixing prices. The action of the senate in defeating the more radical taxation proposals, together with the news that the government had purchased 77,000,000 pounds of copper for immediate delivery to Great Britain, France and Italy, at 25c, created a better feeling in the trade. This better feeling was reflected more directly in advancing prices for copper than for other metals, however.

The fact that the government will pay 25c for copper being purchased for the allies gave support to the opinions of those who have maintained the government does not intend to make a drastic reduction when it fixes the copper price. Consequently consumers who had been holding back their requirements showed more inclination to cover their last quarter needs and the week witnessed more active copper buying than in many weeks. Prices advanced about 1½c for all positions. The sub committee on copper of the council of national defense meets with the national council today and it is believed definite action will be taken soon, ending the long period of uncertainty. Electrolytic quotations, on the basis of cash, New York, follow: Spot and September, 27c to 27.50c; October, 26.75c to 27c; fourth quarter, 26c to 26.50c. Prime lake copper for spot delivery is quoted nominally 27c. Casting copper is extremely scarce for September delivery and is nominally quoted 26.50c.

Lead consumers were much confused by the two sudden reductions in the lead price of the leading producer, bringing that seller's quotation from 11c to 10c, New York. Consequently inquiry dwindled off and outside sellers this week have been shading prices, without attracting much interest from consumers. Present outside quotations are about as follows: Spot, New York, 9.87½c to 10c; prompt shipment, 9.75c, St. Louis; October, 9.62½c, St. Louis.

The spelter market has been exceedingly inactive, but a better sentiment prevails and the price decline appears to have halted. The government has withdrawn the proposal that producers of Grade A and Grade B spelter supply 10,000,000 pounds and 2,750,000 respectively of these grades at 12.50c and 12c respectively, and will ask for bids as it did on its last purchase of Grade C. The general quotation of high grade spelter is 13.50c, St. Louis. Prime western is quoted as follows: Prompt and September shipment, 8c; fourth quarter, 8.12½c to 8.25c, St. Louis. Brass special quotations range from 8.75c to 9c.

Aluminum quotations have been declining steadily. Supplies are small but demand is even smaller. There has been some reselling by consumers who had contracted for their own requirements at around 37c but now are on government work and obtaining aluminum at the government price of 27.50c. The outside market is as follows: No. 1 virgin, 43c to 46c; No. 1 remelted, 98 to 99 per cent; 42c to 45c; No. 12 alloy, 33c to 36c. Aluminum sheets are quoted 70c to 75c.

Practically no business is reported in antimony and prices for this metal still are declining. Spot is obtainable at 14c to 14.25c, as compared with 36c last spring.

The various descriptions of copper scrap have gained strength in accordance with the market for the new metals, the past few days, heavy copper crucibled now being quoted 24.50c, red composition 22.50c and heavy brass 15c to 16c. But other classes of old metals have declined, heavy lead now being quoted 8.25c to 8.75c; block tin, 50c to 52c; old cast aluminum, 25c and zinc scrap 6c.

A Great Steel Center in the West

A Resume of Recent Developments at the Minnequa Works of the Colorado Fuel & Iron Co.—Many Improvements Under Way—Output Greatly Diversified—Capacity Increased

BY H. COLE ESTEP

SO MUCH of the iron and steel producing capacity of the United States is concentrated east of the Mississippi and north of the Ohio rivers that comparatively few people appreciate the progress which has been made in steel works development in other sections of the country, notably in the south and west. In the west in particular, from the Mississippi river to the Pacific coast, there have been developments of unusual importance in the past few years. The leading factor in this progress undoubtedly has been the Colorado Fuel & Iron Co.

This great organization, after a checkered career, the details of which are well known to most students of American industrial conditions, is now coming into its own. The history of the Colorado company runs back over 25 years. The concern is widely known for its extensive coal holdings in the Rocky mountain region and for its tremendous annual output of bituminous fuel. The importance of the company as a steel producer is not so generally appreciated even within the iron and steel business. The Colorado company, however, has been a leading factor in the iron and steel business of the far west for a great many years and at the present time the Minnequa works at Pueblo, about 115 miles south of Denver, may be classed among the leading steel plants of the western hemisphere. Built originally as a rail producing plant, in 1881, the Minnequa works has been gradually enlarged over a period of years until today a great variety of products is turned out, including pig iron, steel castings, merchant bars, light shapes, hoops, spikes and bolts, rods and a full line of wire products, including plain and galvanized wire, barbed wire, field fencing and nails. In a few months the company will be in a position to market coke oven by-products including sulphate of ammonia, benzol, etc.

The process of extending and improving the Minnequa works has been gradual. A rather unusual amount of new construction, however, has been concentrated into the last two years. The construction program is by no means complete at this writing, extensive and important improvements being under way at the present time. Among the enlargements recently completed, in process of construction, or contemplated for the immediate future, the most important are the following:

A complete by-product coke oven plant with an initial unit of 120 Koppers ovens, which, it is expected, will be operating in September.

A new cooper shop with a capacity of 5000 kegs per day to replace the one recently destroyed by fire.

Additional soaking pits at the rail mill and 40-inch blooming mill.

A Dwight & Lloyd sintering plant for treating flue dust and New Mexican concentrates.

Gas washing apparatus for cleaning the gas burned under the boilers.

A new bar mill warehouse.

New comfort stations for the convenience of the workmen.

Additional power plant apparatus including low pressure turbines which utilize exhaust steam that previously went to waste.

Additional galvanizing and wire mill facilities.

The general arrangement of the Minnequa works showing the location of the various departments and

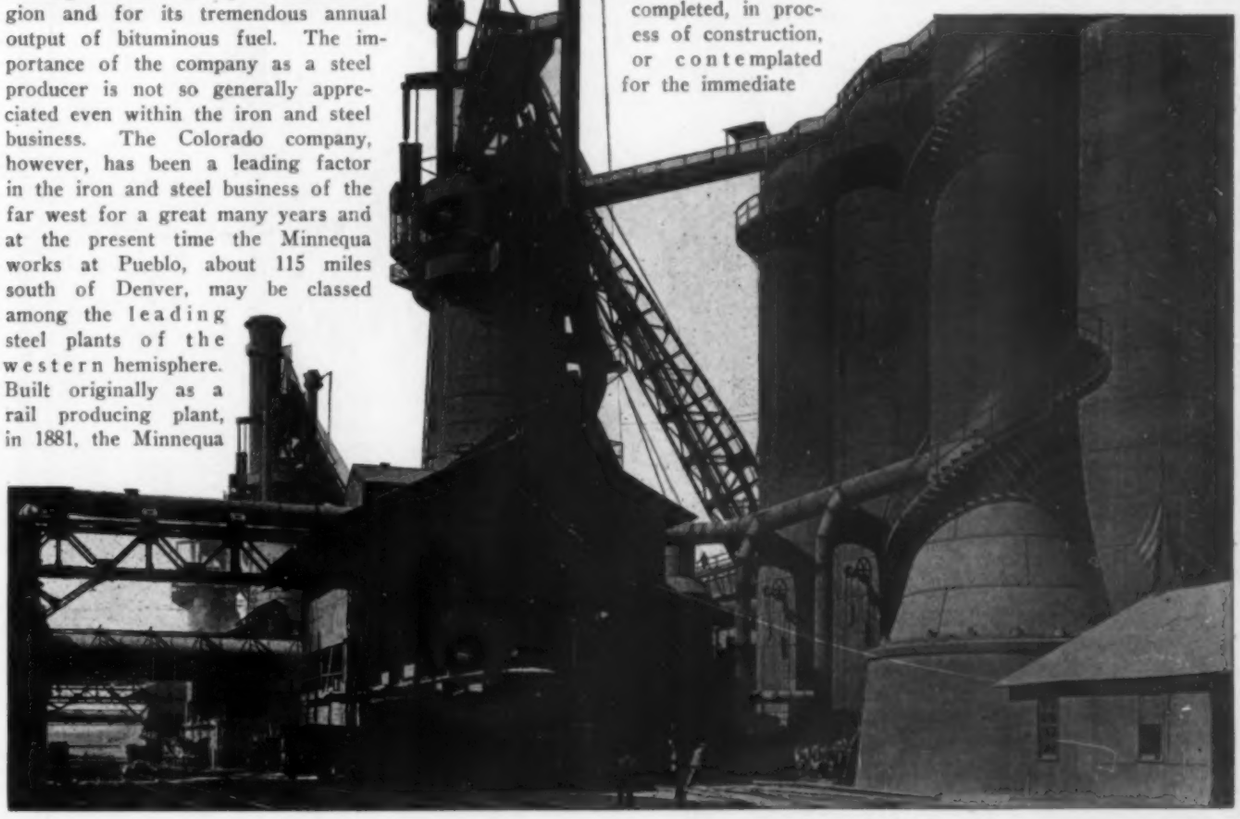


FIG. 1—MODERN SKIP-FILLED BLAST FURNACES, D. E AND F AT THE MINNEQUA WORKS OF THE COLORADO FUEL & IRON CO.

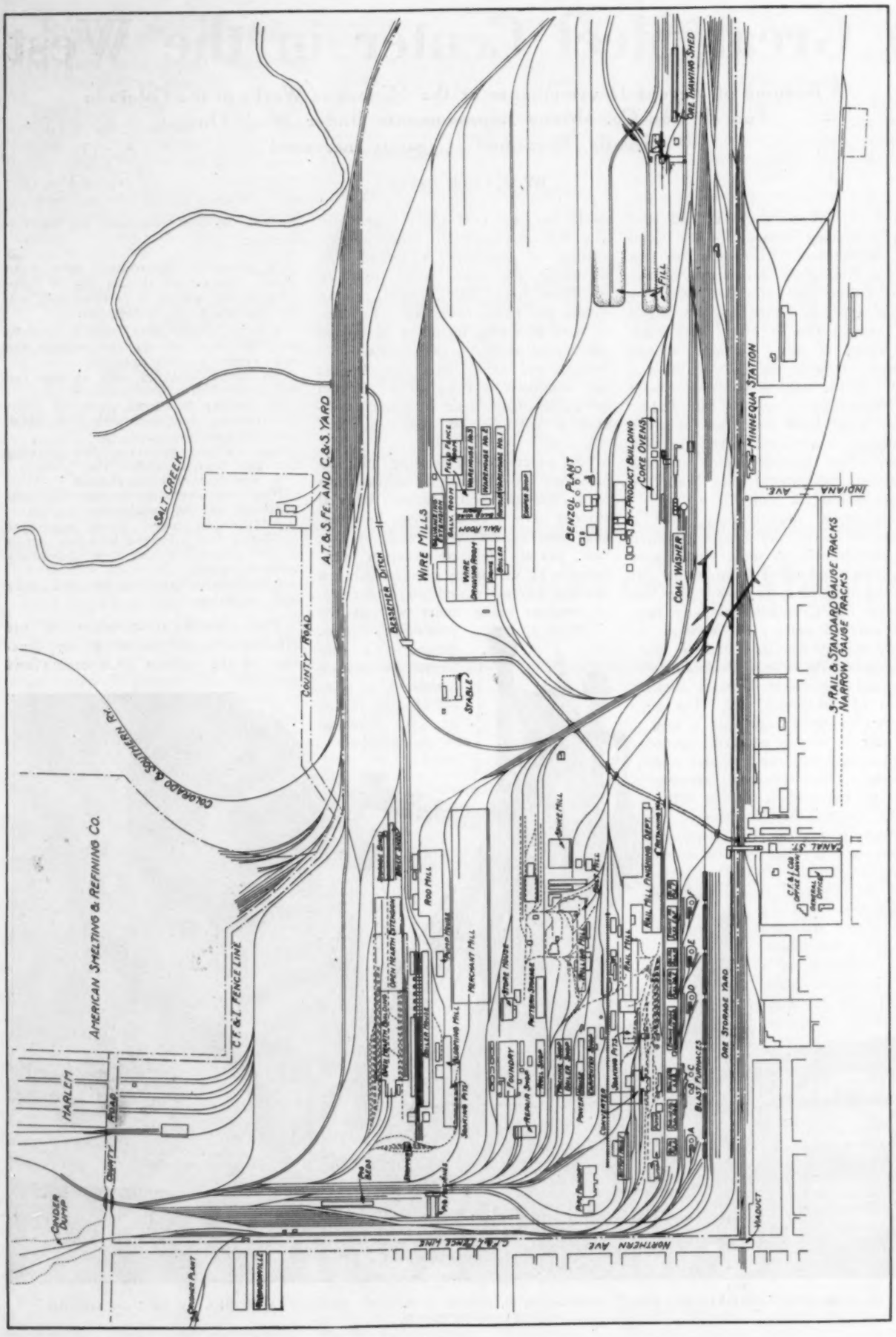
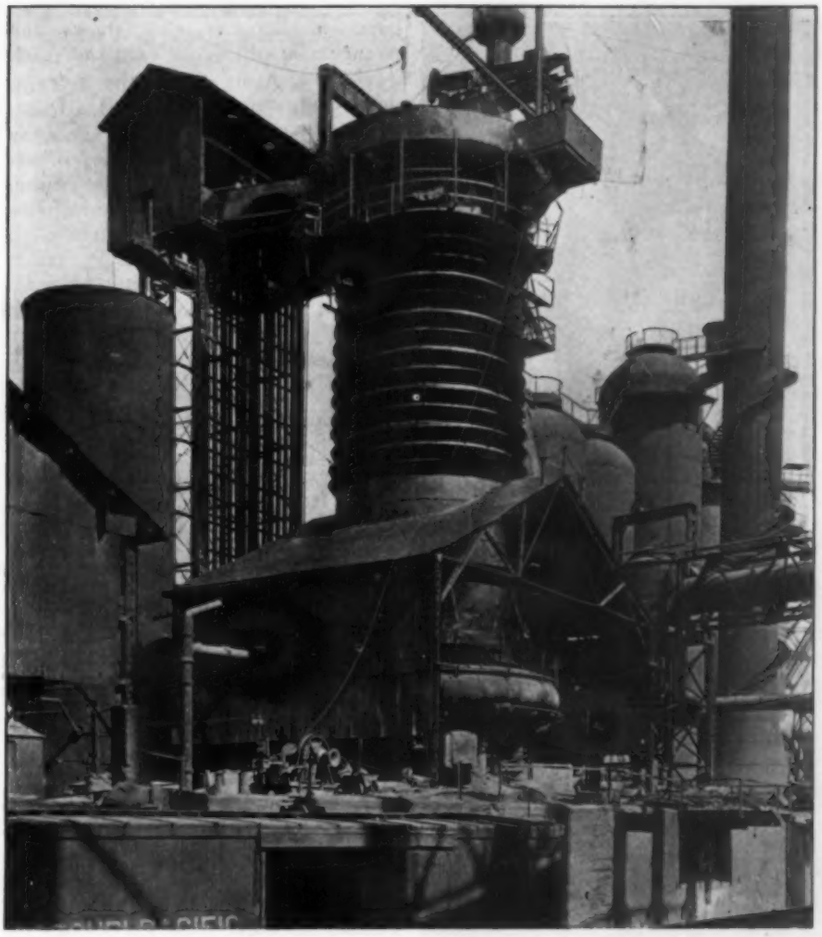


FIG. 2—MAP OF THE MINNEQUA WORKS OF THE COLORADO FUEL & IRON CO., SHOWING GENERAL ARRANGEMENT OF DEPARTMENTS AND TRACKS



the layout of the tracks is shown on the accompanying map, Fig. 2. It will be noted that the main elements of the plant include one dismantled and six active blast furnaces, a bessemer department, open-hearth department, blooming mill, rail mill, merchant mill, hoop mill, rod mill, wire mill, coke oven plant, shops, spike mill, iron bar mill, etc. These units are arranged on a generally rectangular plot of ground which lies east of the old main line of the Denver & Rio Grande railroad. The main axis of the property lies north and south and most of the buildings follow this direction.

At the present time the plant has an output of approximately 60,000 tons per month including 30,000 tons of rails, 20,000 tons of merchant bars and 10,000 tons of nails and wire products. The importance of the Minnequa works as an iron and steel producing unit are emphasized by the fact that its operations have made Pueblo the largest freight center west of St. Louis. Concrete figures tell the story: the Minnequa plant handled 16,746 freight cars in April and 16,702 in May of this year.

The blast furnaces are placed in a row on the western edge of the property. The general arrangement of the furnaces is shown in Figs. 1, 3 and 4. These illustrations clearly indicate the modern character of the con-

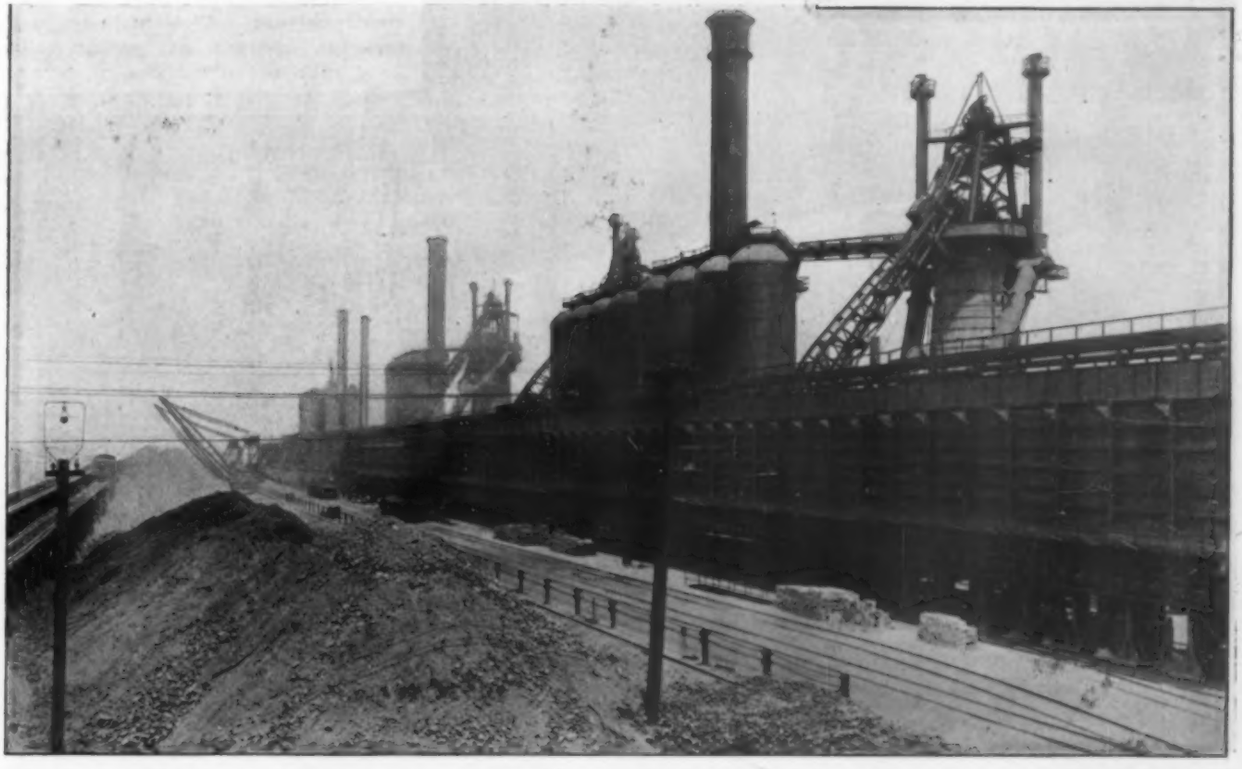
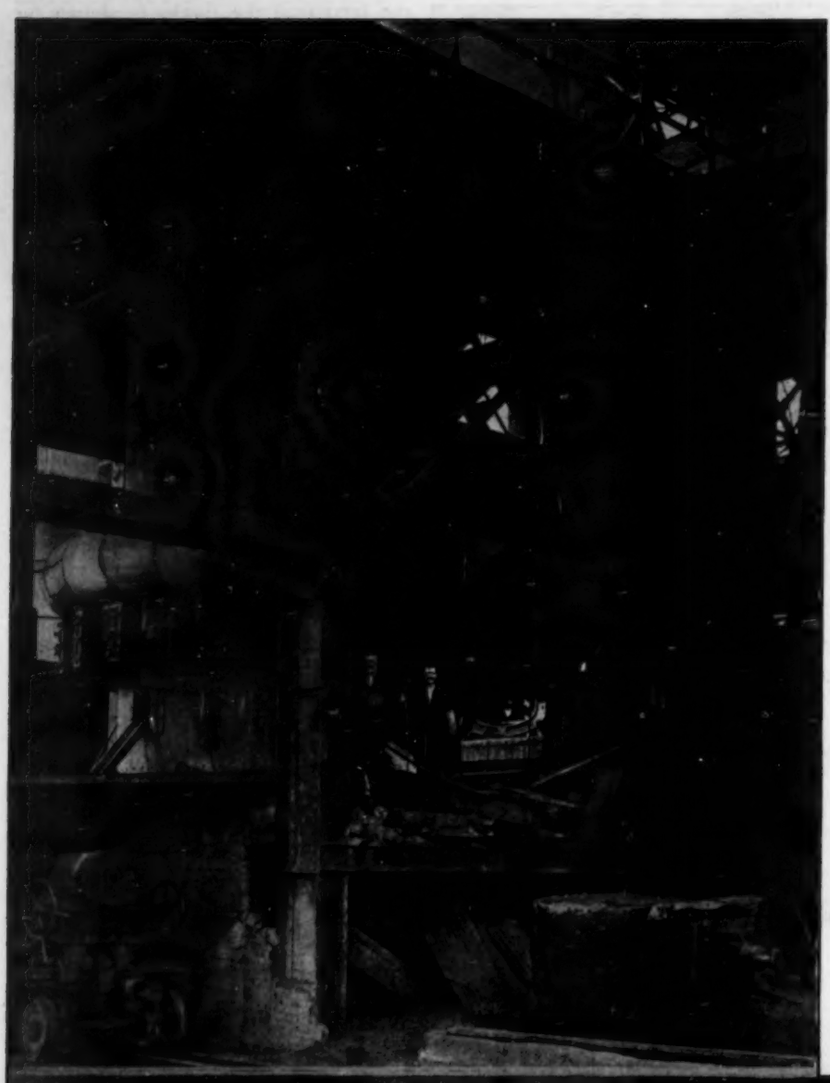


FIG. 3—SPIEGEL FURNACE SHOWING SPECIAL COOLING SYSTEM FIG. 4—GENERAL VIEW OF BLAST FURNACES FROM THE SOUTH SHOWING ORE YARDS AND STOCK TRESTLE



struction. Fig. 4 also shows the arrangement of the ore yard and stock trestle which lie along the western side of the furnaces.

The details of the six furnaces, as given in the *Iron and Steel Works Directory*, published by the American Iron and Steel Institute, are as follows:

Furnace	Size, feet	Built	Stoves No.	Stoves size
A	80 x 21	1901	4	106 x 21
B	75 x 17	1891*	3	70 x 18
			1	93 x 21
C	75 x 16½	1881†	5	60 x 15½
D	80 x 21	1902	4	106 x 21
E	90 x 20	1902	4	100 x 21
F	85 x 20	1902	4	102 x 21

*Rebuilt in 1901.
†Rebuilt in 1893.

The ore for the furnaces is obtained from the company's mines in Colorado, Wyoming and New Mexico, most of the ore coming from the Sunrise mine, Wyoming. It is a red hematite, a large percentage of which must be crushed, and is generally high in alumina. A large slag volume therefore results. Some of the New Mexican ore is received in the form of concentrates which later on will be sintered with the flue dust. At the present time, some of the flue dust is magnetically separated and some of it recharged into the furnaces in the raw state. The new sintering plant, which is of the Dwight & Lloyd type, is being installed by the C. O. Bartlett & Snow Co., Cleveland.

Some of the ore comes a considerable distance, but owing to the fact that the company has exceptionally good railroad connections, it is not

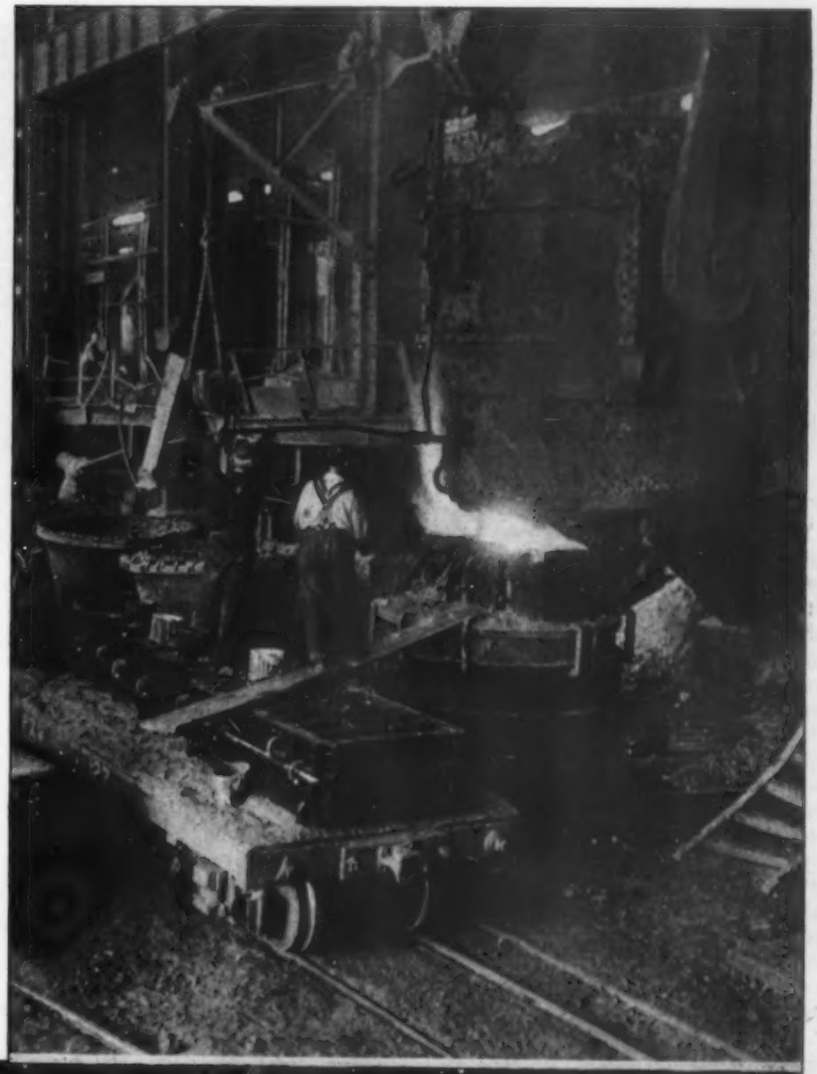
FIG. 5—SCRAP MELTING CUPOLA 14 FEET IN DIAMETER FIG. 6—CHARGING SIDE OF OPEN HEARTH FURNACES—NOTE AMERICAN FLAG WORKED IN FLOOR WITH FURNACE CHARGING MATERIALS

necessary to carry a large stock at the furnaces. Fig. 4 shows a normal supply. Ore shipments are received right through the winter. In the coldest months the cars frequently are frozen, and in order to avoid handling solid ore, steam thaw houses have been provided.

As shown in Fig. 4, the ore and limestone are transferred from the storage piles to the stock bins in standard gage railroad cars. Traveling gantry cranes of the jib type, shown in the left background in Fig. 4, are used for loading ore and stone from the storage piles. Fig. 4 also shows clearly the general arrangement of the stock trestle. Electrically driven scale cars of the usual type are provided for transferring the ore, stone and coke from the bins to the skip filling hoppers. These larry cars are provided with a simple double-ended scale beam, which automatically subtracts the tare. It was patented May 26, 1903, by M. Maurer, one of the old employes of the Minnequa works.

As previously stated, facilities are now being planned for washing the furnace gas, most of which is burned under boilers for steam-making purposes.

The arrangement of furnace *B* which is used for making spiegel is interesting. As previously stated, the details of this stack are shown clearly in Fig. 3. It is of the hand-filled type. Like other spiegel furnaces it runs very hot and in order to supplement the ordinary cooling arrangement, the series of water



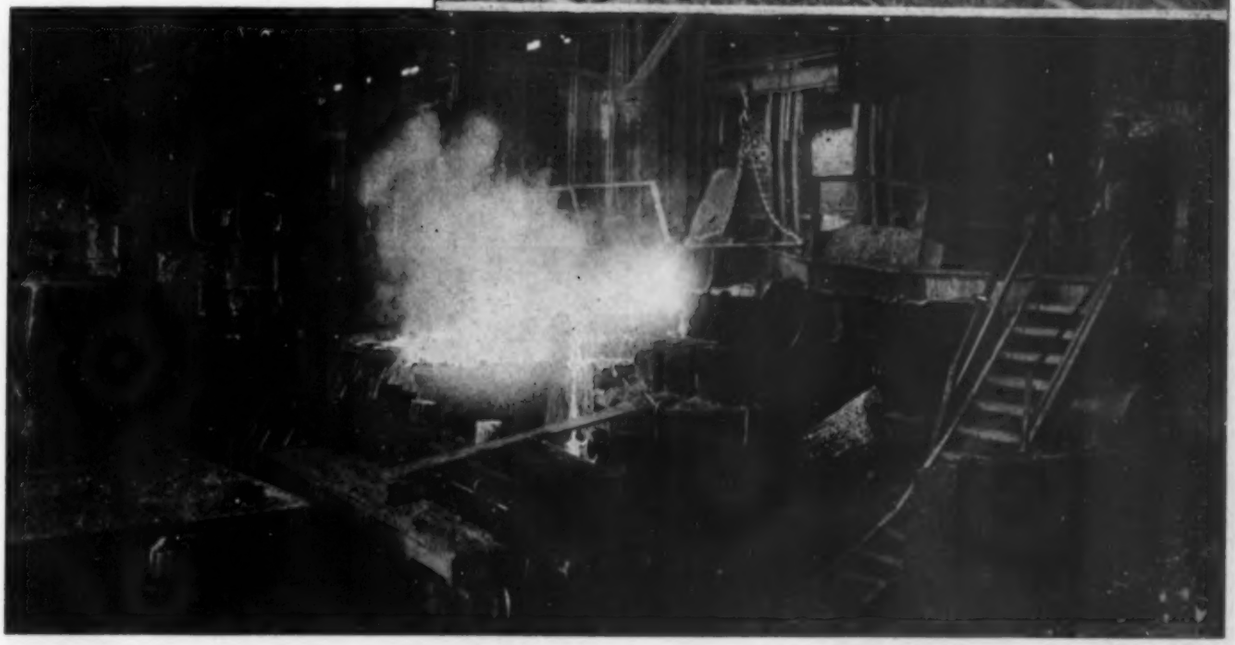
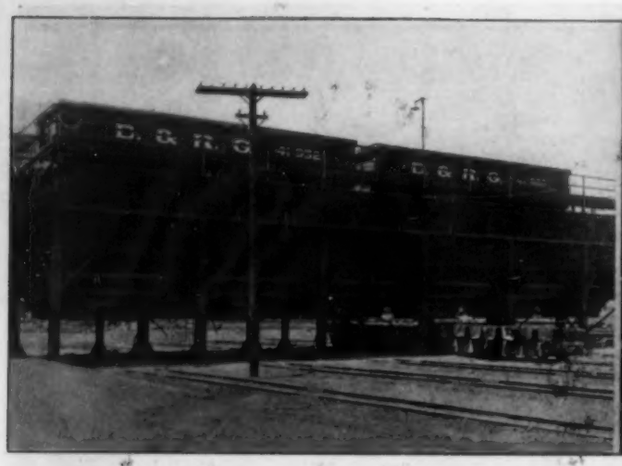


FIG. 7—TAPPING OUT A HEAT IN THE OPEN HEARTH DEPARTMENT FIG. 8—POURING STEEL CASTINGS IN THE OPEN HEARTH DEPARTMENT



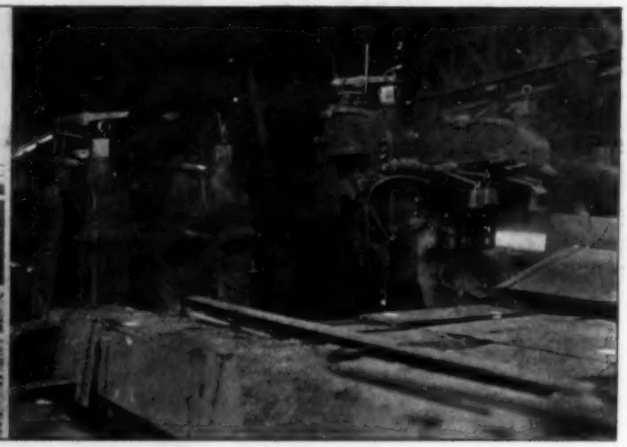


FIG. 9—STONE BINS FOR FILLING OPEN-HEARTH CHARGING BOXES FIG. 10—CHILLED ROLL FINISHING PASS IN THE RAIL MILL

troughs shown in Fig. 3 have been provided. They are of steel plate construction and are riveted to the furnace shell between the roof of the cast house and the top platform. The troughs are concentric instead of being spiral, as might be judged from the illustration. The lips of the troughs are about 12 inches wide. Each trough is pierced with small holes next to the shell at regular intervals and the water trickles down the shell through these holes from one trough to another. This arrangement, which is unique in American blast furnace constructon, has proved unusually satisfactory. A great many of the troubles incident to the high temperature at which the furnace must be operated have been obviated.

Thirty to 35 per cent spiegel is produced, about 150 tons per day being turned out. The necessary manganese ores are obtained from New Mexico and Leadville, Colo., where deposits averaging 20 per cent manganese are available.

The pig iron produced in the main furnaces is transferred to the bessemer converters and open-hearth department in ladle cars in the usual manner. The Sunday melt and any excess iron not required by the steelmaking department is handled in two pig casting machines of the Uehling and Heyl & Patterson types.

For melting up ladle skulls and other scrap the cupola shown in Fig. 5 is provided. It is interesting, not only on account of the use to which it is put but due to its exceptionally large size. It is believed to be one of the largest cupolas in the United States. It is 14 feet in diameter inside of lining and about 28 feet in height above the hearth. It is of the bessemer type. In other words, it is provided with a bustle pipe and individual tuyeres instead of a wind box. In this respect it is similar in construction to a blast furnace. In fact, it is equivalent in capacity to many of the small furnaces in operation 20 years ago.

As previously stated, it melts ladle skulls and miscellaneous scrap, some of which accumulates around the plant and some of which is purchased. The output is about 300 gross tons per day. The hot metal is transferred in ladle cars of the type shown in Fig. 5, directly to the open-hearth furnaces, without being put through the mixer. This cupola, therefore, materially augments the output of the blast furnaces and in times like the present, when tonnage is the chief consideration, it is of immense advantage.

The general arrangement of the charging platform, which is of steel plate construction, is shown clearly in Fig. 5. The top of the cupola, which is open, it will be noted is flush with the charging platform. The coke and scrap are charged in large buckets handled by a heavy traveling crane. Since the top of the stack is open, the charging operation is very simple, the buckets being merely dumped over the mouth of the furnace. A hole in the roof over the cupola provides for the exit of the gases. The cupola is slagged off like a regular blast furnace, the slag notch being shown at the left in Fig. 5.

The steelmaking facilities at the Minnequa works include both bessemer and open-hearth departments. The bessemer department, which is located immediately east of the blast furnaces, includes

FIG. 11—BY-PRODUCT COKE OVENS AND BENZOL PLANT UNDER CONSTRUCTION FIG. 12—INTERIOR OF NAIL WAREHOUSE

FIG. 13—WIRE-ROPE ROD CONVEYOR

the usual cupola equipment and two 15-ton converters. Originally, this apparatus was installed for making bessemer rails. All of the rails rolled at the Minnequa works at the present time, however, are made of open-hearth steel, the bessemer output being utilized entirely for merchant bars and wire.

The open-hearth department is located in the northeastern corner of the plant directly across from the blast furnaces. Its general arrangement is shown in Figs. 6, 7 and 8. In Fig. 6, which shows the charging side of a portion of the furnace, an American flag worked into the floor by the employes with magnesite, iron ore, etc., may be seen in the foreground. This item is interesting in that most of the employes are of foreign birth or extraction. The open-hearth equipment in service today includes 15 stationary furnaces of 75 tons capacity. The furnace bays are equipped with low-type charging machines, heavy duty cranes, etc., in the usual manner. An excellent idea of the pouring side of the furnaces is obtained from Figs. 7 and 8. The steel is first poured into ladles from which it is transferred to the ingot molds by means of a crane in the customary fashion. A standard-type mixer is provided for holding the hot metal.

In addition to the pig iron from the blast furnaces and the scrap from the cupola previously mentioned, considerable cold scrap is charged into the furnaces using charging boxes of the standard type. The normal mixture consists of about 50 per cent scrap and 50 per cent pig iron.

New, modern bin equipment, shown in Fig. 9, has been provided for handling the stone used in the open-hearth department. The arrangement consists of two rows of six steel-plate bins equipped with chutes and lever gates at the bottom, so arranged that the charging boxes which are run in on a track underneath, may be readily filled by gravity. The stone is brought to the works in hopper-bottom gondola cars which are switched in over the bins on parallel tracks as shown in Fig. 9. Each of the two rows of bins has a capacity of six carloads of stone. Enough stone, therefore, may be carried in the bins to take care of the operation of the open-hearth department for two days.

Dolomite Cupolas

The company burns its own dolomite in three cupolas which are provided for the purpose. The open-hearth department occupies a space approximately 1200 feet long and 300 feet wide.

After the ingots are stripped, they are transferred to the blooming mill and rail mill soaking pits, the location of which are shown in Fig. 2. Both sets of pits are now being extended. One new row, consisting of four 6-ingot holes, is being provided at each mill.

The rolling equipment includes a 40-inch blooming mill, located near the open-hearth department, a 26-inch rail mill, a merchant mill, rod mill and iron mill. Most of this equipment has been in service for some time and the mills, generally speaking, are driven by steam engines, which are either directly connected to the roll spindles or provided with rope drive. The general arrangement of the various mill units is clearly indicated in Fig. 2.

The rail mill has been improved by the addition of an extra stand of chilled rolls which form the final pass. These rolls considerably improve the finish of the rail. They are 26 inches in diameter and were built completely at the Minnequa works. This improvement is shown in Fig. 10, which also indicates the general character of the rail-mill equipment.

The rod mill, which is of the Garrett type, is completely equipped. It has a capacity of approximately 10,000 tons of rods per month. After the rods are coiled on machines of the usual type they are transferred to the wire mill by means of the five-strand cable-type bundle conveyor shown in Fig. 13. This illustration also indicates the general arrangement of the rod mill. The bundle conveyor, which is electrically driven, is approximately 2300 feet in length. It is placed in a concrete-lined pit or trough about 10 feet wide.

The bar-mill warehouse, which has been recently improved, is located between the merchant and hoop mills. It is now 600 feet in length and 225 feet in width, the width extending over

FIG. 14—PILING MACHINE IN STEEL FENCE WAREHOUSE

three bays. It is completely equipped with cranes and served with depressed tracks and loading docks.

A portion of the product of the merchant mill is transferred to the spike mill, the location of which is clearly indicated in Fig. 2. This department is equipped with five Vandergrift spike machines, with an aggregate capacity of 130 kegs per day.

Wire Mill is Completely Equipped

The wire mill is located in the southwest corner of the property. It is provided with facilities for drawing and galvanizing plain wire as well as for manufacturing barbed wire, field fence and nails of all sorts. Extensive warehouse and storage facilities also are provided, together with a cooper shop and other auxiliary departments. At present 448 wire-drawing blocks are in operation, together with 129 barb machines, 280 nail machines and a number of fence machines.

The cooper shop, which was destroyed by fire early in June, is now being rebuilt of fireproof construction. The new shop will have a capacity of 5000 nail kegs per day, together with sufficient facilities for turning out all of the boxes and wire reels required. It will be located on the site of the old cooper shop, immediately west of the wire mill. Extensive improvements also have been made recently to the wire mill warehouse and shipping facilities. At the present time there are three warehouses, one of which is shown in Fig. 12 and another in Fig. 14. These warehouses are approximately 60 feet wide and 400 feet long. They are equipped with special facilities for handling and piling material including storage battery trucks and an escalator, Fig. 14, built by the Brown Portable Elevator Co., Chicago.

Two new galvanizing frames were added to the wire mill equipment during the past year. During the winter they were operated in the open. A number of minor improvements are now being completed in the wire mill including additional facilities for the comfort of the employes.

The coke ovens, which are being erected by the H. Koppers Co., Pittsburgh, are of the standard Koppers type. The equipment includes a coal washer, pulverizer, storage bins and handling apparatus, together with the ovens proper and the by-product facilities. The latter include apparatus for the separation of sulphate of ammonia by the Koppers direct process, as well as a completely equipped benzol plant. The initial unit consists of 120 ovens and the plant is laid out so it may readily be extended.

Rather extensive improvements have been made to the power generating facilities of the Minnequa works during the past two years. A 1000-kilowatt General Electric low-pressure turbine unit has been provided, utilizing exhaust steam. A 500-kilowatt Westinghouse high-pressure turbine also has been installed recently and another 1000-kilowatt low-pressure unit has been ordered for the wire mill. About 1,000,000 kilowatt-hours of electrical energy are generated per month. The ratio of electric power to steam power is rather low on account of the large number of steam main mill drives. Additional boiler equipment also is being provided, including two 500-horsepower Sterling water tube boilers equipped with automatic stokers which are being installed in the wire mill. The existing boiler capacity, of course, is extensive, owing to the large amount of steam consumed. The blooming mill unit alone, for instance, consists of thirty-six 500-horsepower Sterling boilers, located alongside the open-hearth furnaces.

As far as possible, blast furnace gas is used for steam generation. A large tonnage of coal also is consumed. At the present time, however, the company feels that the coal supply of the country should be conserved for patriotic reasons and, therefore, a considerable tonnage of lignite is being consumed at the Minnequa works in lieu of the excellent bituminous coal produced by the Colorado company.

Costly Water Supply

It may be mentioned in the passing, that the water supply facilities for the Minnequa works are extensive, including a 35-mile ditch between the plant and the Arkansas river. This water supply, which was installed a number of years ago, cost about $1,000,000. It probably could not be duplicated today for twice that sum.

Owing to the comparatively remote location of the plant from manufacturing centers, it has been necessary to provide unusually complete shop equipment, including extensive foundries, machine shops and roll shops. The company makes practically all of its own rolls and also does a great deal of the construction and repair work around the plant with its own facilities.

The foundry, which is approximately 300 feet long and 150 feet wide, is equipped with three Whiting cupolas, 72, 46 and 36 inches in diameter inside of lining respectively. In addition a small cupola is provided for melting white iron and a 10-ton air furnace for turning out fine castings. The steel castings usually are poured from basic metal in the open-hearth department as shown in Fig. 8. The molds are made up in the foundry and transferred to the open-hearth pouring bays on flat cars as shown in this illustration. The machine shops and roll shops are equipped on a scale similar to that of the foundry. All of the chilled dies used in the wire-drawing department are made in the company's own foundry.

Basic Ingot Molds

For some time the Minnequa works has followed the practice of making its ingot molds of basic instead of bessemer metal. They are made somewhat heavier than if bessemer metal were employed. The ingot stools also are cast out of the same material. The basic molds have proved entirely satisfactory. They are now 20½ x 22 inches in cross section at the top with a 1-inch taper. Formerly 18 x 20-inch molds were used. These molds last for about 150 bessemer and 67 to 70 open-hearth heats.

The Colorado Fuel & Iron Co. devotes special attention to the comfort and welfare of its employes and large amounts of money are expended annually for this purpose. At the present time, a number of extensive new comfort stations are under construction at the Minnequa works, supplementing facilities which previously were considered adequate. For the convenience of the employes, a very completely stocked general store is operated near the works.

The Minnequa hospital, it can safely be stated, is one of the most extensive and completely equipped industrial hospitals in the world. There are no wards, all of the patients being taken care of in private rooms. Every facility which modern medical science can conceive has been provided. The hospital officers keep constantly abreast of the latest medical developments. Since 1914 a number of them have made a special study of surgical advances growing out of the war in Europe and the latest methods of treatment will be found at the Minnequa hospital. The hospital is available not only for the treatment of accident cases but also for meeting any other demands which may be made upon it by the company's employes.

The special efforts which the Colorado company has been making during the last few years to promote an *esprit du corps* are widely known. The details of this phase of the company's work have been covered in full in previous issues of THE IRON TRADE REVIEW.

The efforts of the management to promote the well-being of its employes are bearing fruit and it may now

(*Concluded on page* 542)

Electricity For Japanning Ovens

Accurate Temperature Control and Reduction of Fire Hazards Are Two Features of Electrically Operated Japanning Ovens—Advantages of Various Types Are Outlined in This Article

BY C. D. CARLSON

THE term japanning refers principally to the covering of wood or metal with a coat of black varnish and hardening by baking in an oven. The process as used today can be regarded as a step between painting and porcelain enameling.

Some great strides have been made in shortening the time of japanning operations in the last few years. Most manufacturers who formerly allowed 5 to 9 hours to complete their baking operations, are now doing the same work in from 30 minutes to 1 hour. Even better speeds are expected; in fact, laboratory tests have produced perfectly baked japan in 10-minute periods. In this case the heat is generated electrically within the part to be japanned. This, however, is not the commercial electric japanning in which we are interested. In this case, the oven is heated largely by energy radiated from the hot metal of the heating units and only to a slight degree by convection.

Description of Resistors

The electric heating units consist, in general, of a framework of steel or cast iron, supporting insulators made from mineral compounds which afford high insulation resistance even at the fusing point of the metal resistor. This resistor is usually nickel-chrome alloy, manufactured as a flat ribbon. This ribbon is wound continuously around two insulators, thus forming one heating unit. It is non-corrosive in air at 1472 degrees Fahr. and as applied in japanning ovens, seldom reaches a temperature above 600 degrees Fahr. Practice has shown that it is best, where a number of these heaters are connected, as in ovens, to use steel bars and to have all connections mounted upon insulators having the same characteristics as the heat insulators.

The complete heater as used in japan ovens usually runs in units of from 2½ to 10 kilowatts each. They are small and easily movable, enabling them to be placed and replaced anywhere on the walls or floor within an oven until practically a uniform temperature is obtained throughout. This leads to high quality finish and speed together with duplication of work, both as to quality and time.

Microphotographs taken of japanned pieces where the same grade metal is covered by the same japan in the same room, one man performing all operations, show that the higher the proportion of heat by radiation and the less by convection, the higher the quality of the work. For instance, the photographs of tests where convection currents supply the heat show the work with large volcanic-like craters unevenly distributed over the surface. These, as well as checks and cracks, not only tend to give the completed work an uneven finish, but they also impair its weathering qualities, since moisture and air can more readily reach the bare metal through these weakened spots. On the other hand, the electrically heated pieces show considerably smaller craters much more evenly distributed.

Convection heat does not seem to have the penetrating effect of radiant heat. For example, a boiler room at a given temperature will not exhaust a man as quickly as the direct rays from the sun at the same temperature. From this it would seem that the first effect of convection heat in japanning ovens is to sear over the outer film of the japan before the inner film has hardened. The inner film of japan, or that next to the metal, then must liberate its volatile solvents, and these, forcing their way through the partly hardened outer film, evidently produce the explosive looking craters.

From the fewer and smaller craters of the electrically baked sample it would seem the energy radiated from the electric heaters penetrates the coat of the japan so rapidly that the volatiles from that part of the japan next to the metal are liberated before the outer film has set to any great extent.

Control of Temperatures

The control of temperatures in japanning is most essential; especially where it is desired to insure uniform production of duplicate parts. Electricity can be depended upon to afford ready, simple and dependable control. As applied to japan ovens, it takes two distinct forms. First, hand control, consisting of numerous switches so connected with the heating elements that the desired number of heaters to produce or hold a given temperature can readily be turned on or off. This is a cut and try method, but in several instances is giving very satisfactory service. The second method is the automatic control. Several types of thermostats have been tried out on this work, and it is only after considerable experimenting by different engineers that a type of instrument has been found which gives the desired results. This is a capillary tube thermometer which actuates a contractor through a relay throwing off part or all of the heaters when the oven reaches the desired temperature, and again throwing these heaters in when the temperature falls. The bulb or sensitive member of the thermometer is usually about 15 feet in length and is immersed in the oven. The extension of this tube outside of the oven is armored and made of sufficient length to properly locate the instrument. A liquid which vaporizes at a temperature slightly above ordinary atmospheric temperature is used as the actuating fluid. The instrument as manufactured has two indicator hands which are set at the maximum and minimum points of temperature desired.

Types of Ovens

Japanning ovens, in use today, can be divided into three types: The box or kiln type, the semicontinuous conveyor type, the continuous conveyor type. Little need be said about the box or kiln type, as its construction is generally understood. As used electrically, heaters are usually placed on the side walls or floor, being so arranged as to give the proper distribution of heat.

The second type of oven, or semicontinuous conveyor, has come into popular use where the manufacturer does not have sufficient output of one kind to warrant carrying on the operation continuously. There are two distinct types of this oven: The rotary oven and the box type oven with a conveyor which is moved as the operator desires.

The rotary oven is built in the form of a cylinder with a heat insulating partition through the center. With this arrangement the operator can be loading one-half of the oven while the other half is baking. This oven is very convenient where many pieces of

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The author, C. D. Carlson, engineer, Cleveland Electric Illuminating Co., presented this paper at a recent meeting of the Cleveland Engineering Society.

different sizes and shapes are to be japanned.

The conveyor box type of oven has doors placed at both ends, a conveyor running through the upper parts from which the work is hung. This conveyor is made long enough to extend the same distance beyond each end of the oven as its length within. With this type, one charge is baking within the oven while another charge is being loaded on the receiving end. When the first japan coat is baked, the conveyor is started, moving the baked pieces out of the discharging end of the oven, and the newly dipped pieces into the baking chamber. Ovens of this type are usually built double or triple, depending on whether two or three-coat work is desired.

Features of Semi-Continuous Type

One of the great advantages of the semi-continuous oven over the ordinary box type oven is its conservation of heat. For example, with a baking temperature of 450 degrees Fahr. a new charge can be brought into this oven without the temperature dropping much below 300 degrees Fahr. In the ordinary box type oven the temperature necessarily must drop to a point where the operator can go within the oven to remove the baked pieces.

The third, or continuous conveyor type oven, is theoretically and practically much more efficient than the other types. It consists usually of a long enclosure through which the work is passed on a slowly moving conveying apparatus. If desired, all handling may be eliminated by installing apparatus for loading and unloading the conveyor automatically.

The heating of this oven has been worked out very carefully, with the idea of taking as full advantage as possible of all the available heat. In most cases the electric heaters are so arranged within the different sections of the enclosure that the incoming work is brought up to its final baking temperature by steps. Usually, in the first section of the enclosure, no heaters are installed. When this is the case, the hot baked work is brought out of the oven in such a way as to give up a good share of its stored-up heat to the cold incoming work. It is interesting to note that for the same amount of energy consumed, as high as three times the amount of work has been gotten out of the conveyor oven as out of the box type.

Safety Features of Electric Ovens

Electrically heated ovens from the first have been looked upon as the solution for the prevention of fires and explosions which so often occur in japanning. These safety features have not been over-rated, but care should be taken in the handling of japan as in the handling of any combustible in connection with heat.

When pieces fresh dipped with japan are placed within an oven, there is very apt to be what is called a secondary drip when the heat is first applied. This waste japan will accumulate on the floor of the oven and bake. Each successive oven charge will add to this accumulation until a thick, porous crust of baked japan has formed, which, when heated to 500 to 600 degrees Fahr., in the presence of oxygen, will in time ignite spontaneously. If confined to the oven floor, this burning would be harmless; but if it reaches the freshly japanned work, quite a disastrous fire might result.

Again, when the volatiles given off by the japan strike a surface with a temperature lower than their own, they will condense, forming a deposit on this surface very similar to that previously described. Naturally the flues of the oven will gather most of this condensed volatile.

This deposit may cause two dangerous results: It may ignite spontaneously, back-firing into the oven; or the flues may become so clogged with this deposit that proper ventilation is cut off, leaving an explosive mixture within the oven. Ignition of any sort to this mixture might cause very serious results.

From an electrical standpoint, great care has been taken to prevent ignition, even where the precautionary measures have been disregarded, for the heating units are designed for temperature not much over 100 degrees Fahr. in excess of the oven baking temperature. Except in unusual cases, this temperature will be below the flashing point of japans.

The success of electric heat in japan and varnish oven work has led to considerable investigation along the line of what might be called low temperature heating, that is, temperatures up to 600 degrees Fahr. The results of these investigations have brought out numerous other applications, most prominent among which are, electric core baking ovens, electric bread baking, ovens, ovens for baking cereals, drying woolen articles, and equipments for sherardizing. The field seems unlimited.

From an engineering standpoint, a great deal of time can be spent in developing this infant industry of electric heating. For example, take the electric brass furnace. Several have been brought out, but few, as yet, are fully commercialized.

Again, in the manufacturing of steel a splendid opportunity is offered for investigation, and here we feel that in the next few years very material improvements will be made. This in spite of the fact that electric steel furnaces are competing successfully, today, in making steel castings and special alloy steels.

The industrial electric heating field is far from being confined to the efforts of the electrical engineer. It needs, in fact, the services of the entire engineering profession. For example, I will cite a problem we have before us at present, in a continuous conveyor japanning oven. The manufacturer wishes to japan 1200 thin 5 x 6-foot cast-iron plates per day. For this work it is necessary to develop a conveyor-type oven which will dip the plates in japan, give them sufficient time to drip, bake the japan, conserve the heat by having the baked hot pieces give up their heat to the cold incoming pieces, allow only enough ventilation for safety, and finally, to unload when finished. All this to be done within a floor space sufficient only for loading and unloading, and with a minimum amount of labor. Thus you see the mechanical, the civil and the heating and ventilating engineer each is vitally needed in this problem.

Great Steel Center

(*Continued from page* 540)

be stated that no other large industrial concern in the country has a more thoroughly unified and contented working force than the Colorado Fuel & Iron Co. That this spirit is real is testified by the fact that over 96 per cent of the company's employes voluntarily contributed a day's wages to the $100,000,000 Red Cross fund which was raised in June.

The details of the Rockefeller industrial representation plan which is depended upon to maintain proper relations between the corporation and its employes are generally well known throughout the iron and steel business. The general features of this plan have been fully described in previous issues of THE IRON TRADE REVIEW. The plan is working in an unusually smooth and satisfactory manner and it now seems probable that the Colorado company has hit upon a permanent solution of the industrial relations problem.

The officers of the Colorado Fuel & Iron Co. include: J. F. Welborn, president; Starr J. Murphy, vice president; J. Chilberg, vice president and manager of sales; S. G. Pierson, vice president and purchasing agent; J. A. Writer, secretary and treasurer; J. B. McKennan, general manager; E. S. Condrick, assistant to the president; F. E. Parks, manager of the Minnequa works; E. H. Weitzel, manager, fuel department.

Economy in the Production of Sinter

Charging Sinter Instead of Raw Flue Dust is Beneficial to the Furnace —Dust-tight Motor Coverings, Sprays in the Wind Boxes and Other Devices Effect Economies

THE vital problem of blast furnace practice today is to obtain large tonnage of iron in conjunction with a low production of flue dust. The quantity of dust thrown into the dust catcher depends upon several factors, particularly the velocity of the gas, the working condition of the furnace, and the physical condition of the stock.

A furnace 100 feet high with a stock line of 16 feet, uses approximately 46,000 cubic feet of air per minute and the velocity of the gas is sufficient to keep the particles of stock oscillating continually. Should the furnace slip or start to travel faster, the velocity of the gas is increased, causing a greater shaking up of the stock and carrying along of a greater amount of dust. However, the loss of dust is greater on a furnace whose downcomers lead directly from the top of the furnace to the dust catcher than on one whose off-takes extend upward, then to the dust catcher.

Reducing Production of Flue Dust

The production of raw flue dust is reduced by recharging it into the furnace. Whether or not this is good practice is a matter of much discussion. Some furnaces work very successfully with 8 per cent of the burden flue dust; while on others, it would be very impracticable. One case is cited—that of a 500-ton furnace which produced 1208 tons of flue dust during the month. There were 693 tons of dust recharged leaving an excess production over consumption of 515 tons. The furnace worked normally for about three days, when the blast pressure increased, which, in turn, retarded the driving. The flue dust was dropped and the burden decreased until furnace conditions were righted, after which the flue dust was recharged and the burden brought up to normal. Good practice continued for about four days when the furnace started to hang again causing a decrement in tonnage as well as a non-standard iron.

The cost of recharging raw flue dust is an item of importance and to arrive at the exact figure is a problem, in that the dust being recharged is in turn blown out again, making it a continuous process. No doubt the cost is small numerically in comparison with the cost of sintering the dust. But when the physical condition of the furnace and the quality and production of iron are at stake, this cost becomes quite negligible.

It is the concensus of opinion among various blast furnace superintendents that sinter is beneficial to the furnace and more favorable results will be attained if the flue dust is properly sintered before recharging. Data which is representative of furnace practice with and without the use of sinter, and which justifies the above statement, appears in the accompanying table.

Operation of Furnace With and Without Sinter

Grade of iron.....Bessemer
Amount of Sinter used.....
.....10.5 per cent of Burden
Duration of test.....288 hours

Item	With sinter	Without sinter
Theoretical yield	57.30	56.04
Actual yield	58.06	54.85
Pounds flue dust prod.	132.00	175.00
Blast pressure	14.8	16.00
Production, tons	579.00	566.00
Lbs. coke per ton iron	1,979.00	2,043.00
Burden ratio	2.00	2.02
Temp. hot blast, Fahr.	995.00	1,040.00
Cu. ft. air per min....	41,390.00	41,925.00
Ave. silicon in iron...	1.57	1.69
Ave. sulphur in iron...	0.038	0.040

RESULT:

Theoretical yield increased by.....	1.26
Actual yield increased by.....	3.21
Production, tons, increased by.....	13.00
Flue dust, pounds, decreased by....	43.00
Blast pressure, pounds, decreased by	1.2
Coke per ton iron, pounds, decreased by	64.00
Burden ratio decreased by.....	0.02
Blast temp., Fahr., decreased by....	46.00
Amount air blown, cu. ft., decreased by	534.00

Several methods of treating flue dust so as to get it into a more compact form for charging into the furnace, are at present in operation.

In the Dwight & Lloyd process, the flue dust is unloaded into a storage bin, the bottom of which contains a chute leading to a continuous cup elevator which empties into a revolving, conical, 3/8-inch mesh screen. If the dust contains any particles of coke, it is separated on this screen and passed into a coke bin. The flue dust passing through the screen is distributed to the various storage bins by means of a disc cable conveyor. These bins discharge the product onto a horizontal belt conveyor leading to a sloping chute, the outlet of which is located over the cups of a vertical, chain-driven elevator. This elevator discharges into a hopper at the top of the plant. Leaving this hopper, the dust passes through a screw type pug mill, where it is moistened to make the dust particles cohere more firmly during the process of burning. From the pug mill the dust passes into a hopper having a swinging arm that distributes the dust over moving pallets, the speed of which is controlled by cones of the friction type. Previous to the deposit of flue dust on the machine, a 2-inch layer of 1/4-inch limestone is fed over the pallets as a protector to the grate bars against heat. The pallets pass under a gas burner containing a number of nozzles, the ends of which are flattened and equally spaced over the line traveled by the pallets. The gas from these nozzles is ignited and drawn through the material into a wind box by means of a fan which exhausts the gases into the atmosphere. The flue dust is now in the sintered form and each pallet discharges its load onto a 3/8-inch screen. The material passing through the screen, containing mostly crushed stone and a small amount of fine sinter, is used over again as screenings or hearth layer; while the sinter that passes over the screen is now in the proper shape for the blast furnace.

Controlling Carbon in Flue Dust

The primary factor in successful sintering is the control of the carbon in the flue dust mixture. Flue dust as it comes from the furnace ranges in carbon from 5 to 10 per cent. If too low in carbon the sinter will be very fragile and mostly dust; if too high, the machine speed will have to be lowered in order to burn all excess carbon above the required amount, which in turn lowers the production.

Under actual working conditions 8 per cent carbon is found to produce a sinter of good quality. With flue dust analyzing about 5 per cent carbon, it has been found practical to add roll scale. The sinter produced from this mix is of a hard structure and contains a higher percentage of iron. There is no reason why coke dust could not be substituted instead, or in fact, any substance that would increase the amount of carbon. However, as scale analyzes from 70 to 75

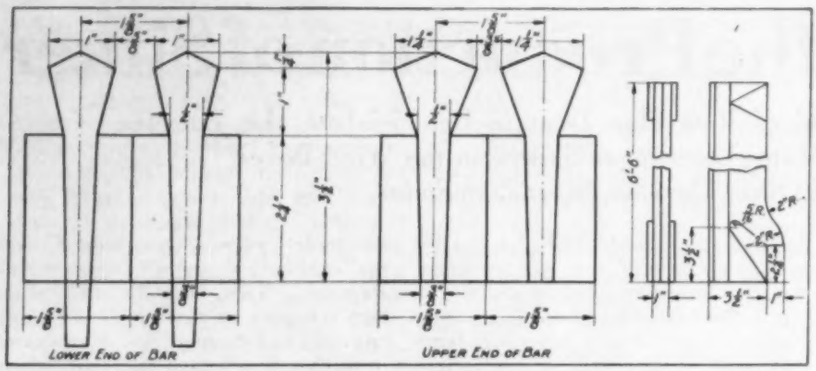

FIG. 1—DETAILS OF SCREEN FOR SEPARATING LIMESTONE FROM SINTER

per cent iron, it is more advantageous to give it preference over coke dust.

There are several sources of economy relative to sintering worthy of notice. In all sintering plants the air is filled with small particles of dust that work into the motor bearings and armatures. If motors located in the plant were of an air-tight construction or all movable parts encased as far as possible, a considerable amount of repair work would be eliminated.

A general idea of the amount of dust deposited in the wind box and directly ahead of the fan can be had from the following figures taken from an actual test of 24 hours' duration:

Average temperature of gases, Fahr....	170
Average suction of fan, inches water...	23
Number pallets produced.....	1347
Sinter produced, tons.....	144
Total flue dust recovered, tons.....	2.3
Dust passing a 100 mesh sieve, the sample having been taken near fan, per cent	55

If a series of centrifugal sprays are installed at the head of the dust catcher, as shown in Fig. 2, the water sprayed in the direction of the gases will eliminate a tremendous amount of the dust; keep the fan blades cool; prolong the life of the fan bearings; and increase the length of service of the gas stack. The principle function of the centrifugal sprays is to thoroughly wet down the particles of dust carried along with the gas. There is no other way than a shut-down of finding out whether or not these sprays are in working order at all times. However, to make sure that all dust particles are weighted down with water, a ½-inch meshed screen is placed about 20 feet from the sprays. This screen stands vertically in the path of the gases. At the top is located a slotted pipe which feeds water over the entire section of the screen continually. The entrained water that is carried through the screen is eliminated by baffles, as shown in Fig. 2, which are 25 inches beyond the screen. The rows of triangular shaped wooden baffles are equally spaced 5 inches apart. The most efficient location relative to the position of each baffle is shown in Fig. 2.

Considerable trouble has been experienced due to the clogging of the grizzly screen that separates and recovers limestone from the sinter. It is essential to have this screen in working order at all times, otherwise there will be a decrease in reclaimed limestone. The amount of stone carried over with the sinter averages 20 per cent. However, this will vary according to the height of hearth layer carried and the condition in which the screen located at the discharge end of the machine is kept. If the screen is permitted to become clogged, a large amount of the stone will be found with the sinter. When this product under these conditions is part of the furnace burden, the result will be a basic slag about the time the sinter reaches the tuyere zone. This screen, 7 x 5 feet, is made of cast 3 x ¾-inch iron slabs, each slab being equally spaced ½-inch apart. To alleviate this clogging and collect a fairly constant percentage of stone, a new screen, shown in Fig. 1, was designed and was found to be more efficient than the one described above. The screen is composed of 35 slabs which are spaced ⅜ and 5/16-inch apart at the upper and lower end, respectively, on the top side. The opening on the rear side and running the entire length of the screen is 1¼ inches. The commendable feature is that any material penetrating the top of the screen will pass through the remaining part with ease.

If the sintering machine is located at a furnace plant equipped with gas cleaning apparatus, the substituting of washed blast furnace gas for natural gas will lower the cost of producing sinter as much as 5 cents per ton. To substantiate this figure costs were compared over a period of six months at one sintering plant and it was found that by using natural gas alone the ignition charge was 0.061 cents; with blast furnace gas it was 0.0077 cents; and with a mixture of both natural and furnace gas, 0.0123 cents per ton sinter. It is, therefore, an advantage to have the mixer valve so arranged that either natural or blast furnace gas could be used singly, as a mixture, or in case one supply fails, the other is available.

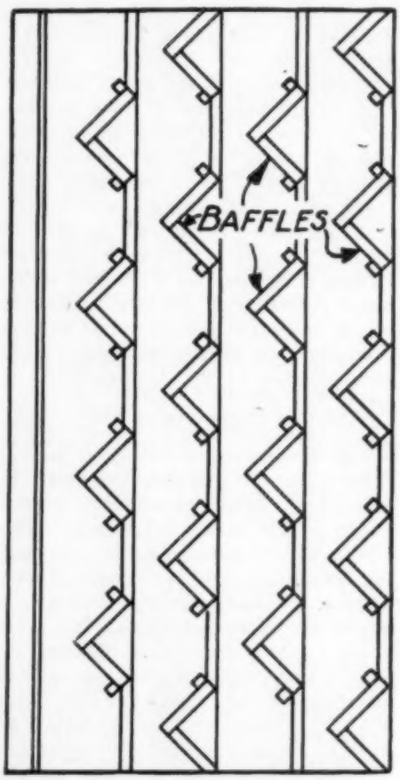

FIG. 3—PLAN OF BAFFLES

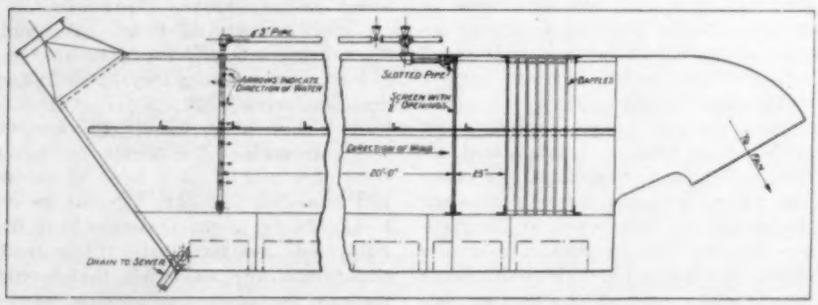

FIG. 2—GENERAL ARRANGEMENT OF WIND BOX SHOWING GAS WASHER

Electrical Reversing Rolling Mills

A Description of Two Typical Installations of Motor Driven Reversing Rolling Mills—The Performance of This Equipment During a Period of Six Months is Given

BY RALPH D. NYE

THE operation of reversing rolling mills by means of electrical drive is a subject to which considerable attention has been given during the past five or six years in this country. The questions which are of particular interest to anyone connected with steel plant operation relate to details of construction and the reliability, efficiency and ease of handling of an equipment.

One of the mills is classed as a 34-inch bloomer, that is the mill pinions are 34 inches in diameter. The main rolls are 29 x 84 inches. This installation was laid out to roll a maximum capacity of 50 tons of ingots, size 18 x 20 inches and weighing about 5500 pounds, per hour, to finished billets averaging 4 x 4 inches, and using 21 to 23 passes. The estimated power consumption with a mill rolling at an average rate of 40 tons of ingots per hour to 4 x 4 inch billets was 26 kilowatt-hours per ton of ingot rolled.

This equipment consists of one reversing motor having a single armature 144 inches in diameter, 700 volts direct current, maximum torque capacity 670,000 foot-pounds. The full field speed is 47 revolutions per minute, and the maximum speed with weakened field about 100 revolutions per minute. The motor is equipped with 24 poles having a compensating winding and also commutating poles. This machine is separately excited by two field windings, one operated from a constant potential exciter and the other from variable potential exciter. It is arranged for forced ventilation.

Motor Generator Set

The motor-generator set of the one flywheel type is made up of one 1500-horsepower induction motor, wound-rotor type, three-phase, 2200 volts, 60-cycle, 20 poles, full-load speed 350 revolutions per minute. This motor is controlled by an automatic liquid slip regulator which is operated by a torque motor supplied by current from a series transformer in the 1500-horsepower motor primary circuit. Regulator is arranged with counterbalance weights, so that adjustment may be made for the torque motor to cut resistance into the 1500-horsepower motor secondary circuit at any desired current value within a wide range. This is generally adjusted so that resistance begins to come in at about full-load current, and thus slow down the motor and allow the flywheel to take some of the load. This 60,000-pound cast-steel flywheel is 15 feet and 5 inches in diameter.

Exciter Generator

The 700-volt generator has a continuous rating of 1960 kilowatts. It has a separately excited field with 14 poles, which are equipped with compensating winding, and commutating poles. The motor-driven exciter set has two exciter generators. One generator is operated at constant potential, 125 volts direct-current, 25 kilowatts capacity and is used to excite the main generator and the constant potential field on the reversing motor. The other generator is operated with a variable potential, since its field circuit is excited by the current flowing in the main circuit to the reversing motor. This generator excites the variable potential field winding on the reversing motor. The excitation from this variable potential exciter being proportional to the main current produces a compounding effect in the reversing motor and causes it to slow down under heavy loads. The variable potential exciter voltage ranges from zero to about 125 volts.

A magnet switch group controls the reversing motor. This group is handled by a drum-type master controller arranged to give 16 speeds in each direction. Automatic acceleration is secured by interlocking circuits and relays arranged to limit the current input to reversing motor.

Some alterations were found advisable in the arrangement of control switches and on the reversing motor since installation. The number of accelerating switches was reduced and some changes were made in relays in order to increase rate of acceleration and speed up operation. On the motor it was found that the commutating pole coils were apt to work loose due to the heavy pulls on them at times of motor reversal, and additional fastenings were added to these coils. Also the interpoles were readjusted to prevent any movement under these stresses. The motor commutator was not under-cut at first and it was found advisable to do this to improve commutation. After under-cutting, a type of brush designed for under-cut commutators was installed.

Since the motor requires forced ventilation, it is necessary to arrange for a good supply of clean, cool air. In this case air is taken from outside the building through a duct about 40 feet above the mill floor, and is not washed. No trouble from dirt collecting in the motor has been experienced. Of course it is necessary to blow out the machine with compressed air and clean it about once a month. About 20,000 cubic feet of air per minute, at 1½ ounces pressure is required to cool the motor, two fans of this capacity being provided.

All bearings on the equipment are provided with oil-ring lubrication. The two main bearings carrying the flywheel are operated water cooled.

These bearings and also the reversing motor bearings are arranged for forced oil feed but the equipment is being run without this. The forced feed is considered an extra safe-guard against bearing trouble. Neither water cooling nor forced feed has been found necessary on the main motor bearings. It was at first thought that on account of the relatively low speed and frequent reversal of this motor, the rings would not deliver enough oil, but experience shows that they do the work satisfactorily. Each motor bearing is equipped with four rings.

Severe Service

As an indication of the severe service that is put on this type of equipment, it may be said that at two different times the motor has twisted off a cast steel connecting spindle used to couple the motor to the pinion housings. This spindle is about 19 inches in diameter. The main motor bearing next to the pinion housing is provided with a thrust collar designed to take up any thrust due to diagonal breaking of this spindle, and in neither of the cases was any damage done to the motor.

As to the rolling capacity of the mill, and the cost of operating the electric equipment, the following table shows the total tonnage of ingots rolled and

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the actual kilowatt-hour consumption per ton for several typical months rolling. This includes all necessary power, such as exciter and motor-driven fan requirements, in addition to the main power supply.

Month	Monthly tonnage	Kw-hrs. per ton
1	21,100	17.7
2	19,400	18.4
3	21,200	18.6
4	18,800	20.6
5	22,100	18.5
6	20,000	24.6
7	21,800	19.5
Average	20,600	19.7

The above tonnage is made up almost entirely of ingots 20 x 22 x 70 inches. Fifty per cent of these were rolled down to 4 x 4 inch billets using 19 to 21 passes. The balance were rolled to a size averaging 6 x 8 inches, using 17 to 19 passes. Approximately 90 per cent of this steel may be classed as high carbon. During the sixth month where a consumption of 24.6 kilowatt-hours per ton is shown a number of new rollers were breaking in on the mill, and this is thought to account for the increase of about 25 per cent above the average in power consumption. No exact costs of attendance of repairs is available, but this item is relatively small and would not exceed 15 per cent of the power cost. The equipment is installed in a main substation where an attendant is required on the switchboard and as he also looks after the mill drive only a part of this attendance cost can be charged to the cost of rolling. The only repairs so far have consisted of brushes and switch contract renewals, the cost of which is relatively small.

Second Equipment

The other installation is a reversing bloomer having 35-inch pinions. This mill is heavily constructed all the way through, being about as heavy as the average 40-inch bloomer. The rolls are 32 x 90 inches. This mill was expected to roll a maximum capacity of 75 to 90 tons of 20 x 21-inch ingots, weighing 7000 pounds each, per hour, to finished billets averaging 4 x 4 inches, using 19 to 21 passes. The power consumption with the mill rolling at an average rate of 75 tons per hour to 4 x 4 billets was estimated at 28 kilowatt-hours per ton.

The driving equipment consists of a reversing motor having two armatures, each 144 inches in diameter. This 600-volt motor, mounted on a common shaft, has a maximum torque capacity of 600,000 foot-popnds. This gives the motor a total maximum rating of 1,200,000 foot-pounds. The full field speed is 40 revolutions per minute and the maximum speed with weakened field 120 to 130 revolutions per minute. The field windings consist of variable and constant potential excited circuits arranged on 24 poles. The machines are equipped with compensating windings and commutating poles.

The magnet switch control equipment is arranged for automatic handling of the equipment and operated by a drum type master controller giving 16 speed points in each direction. The control equipment is operating as originally installed. The only mechanical adjustments necessary were to scrape two of the bearings on the flywheel set. It was found advisable to under-cut the motor commutators and this has been done, giving considerable improvement in commutation. This motor requires about 35,000 cubic feet of cooling air per minute Two fans of this capacity are installed, one is held in reserve as a spare except in very hot weather when both are operated together. The air supply is taken from outside the substation building and is not washed. No trouble from dust collecting in motor has been experienced except that it is necessary to blow it out about once a month. Rolling conditions are such that additional cooling to be secured from washed air is not necessary.

All the bearings of this equipment are arranged with oil ring lubrication. Cooling water is used on the two flywheel bearings. It was found advisable to put forced oil feed on all the five bearings of the motor generator set in addition to the oil ring lubrication. The motor bearings did not require it for regular operation but it was provided as an emergency measure.

The following table shows the monthly tonnage rolled since this mill was started, and the total kilowatt-hours consumption per ton of ingot.

Month	Monthly tonnage	Kw-hrs. per ton
1	15,000	33.5
2	14,800	32.0
3	19,000	30.5
4	21,000	28.5
5	25,000	27.0
6	22,000	26.7
Average	19,500	29.7

This tonnage consists of ingots 19 and 21 inches, weighing 6000 pounds each. Seventy per cent of these were rolled to 4 x 4 inch billets using 23 to 25 passes. The balance were rolled to a size averaging about 6 x 6 inches and using 19 to 21 passes. Sixty per cent of this steel may be classed as high carbon. The gradual reduction in power consumption per ton from month to month is no doubt due more to expert handling of the mill and also the increased rate of rolling. The electrical equipment including switchboards rotaries and tranfsormers is installed in a sub-station. The attendance consists of one operator on each turn with a helper on day turn. The attendance costs chargeable to the blooming mill is not more than 1 per cent per ton of ingot it rolled. No repairs except a few brushes and switch contacts have as yet been required.

It is interesting to compare the power consumption per ton of steel used by the equipments described above.

The averages of the above tables show the equipment last described is using 29.7 kilowatt-hours per ton and that first described is using 19.7 kilowatt-hours which is 10.0 more for the second mill. The six-month run on the second drive includes several months breaking in and some low tonnages so that a fairer basis of comparison would probably be to take the average of the last three months. This average shows a total tonnage of 22,500 and power consumption of 27.4 kilowatt-hours per ton of ingots. This amounts to about 10 per cent higher tonnage and 7.7 kilowatt-hours per ton, or almost 40 per cent more power than the first mill drive required.

Cause of High Power Consumption

This higher power consumption by the second equipment may be accounted for in several ways. The mill is larger and of course heavier, having been designed to take care of large ingots and heavy drafts. The drive was laid out to roll 50 per cent more steel than the other drive. The first mill is rolling its rated average capacity of 40 tons per hour, and the second mill is rolling under rated capacity. Also the second equipment is rolling a higher percentage of 4 x 4, that is 70 per cent against 50 per cent on the first. The second mill is making lighter drafts and more passes per ingot. Also it may be noted that the estimated power consumption, made before the mills started to roll was 26 kilowatt-hours and 28 kilowatt-hours per ton of ingot rolled, to four by four, on the first and second mills.

It is apparent that the first mill is meeting expectations in the matter of power consumption. The second equipment at present rate of rolling is probably not down to estimated consumption of 28-kilowatt-hours per ton of 4 x 4 billets. No doubt it would meet this estimate if the steel were drafted heavier and 75 tons per hour rolled.

The second equipment is adapted to heavier drafts and fewer passes, and the comparison shows the advantage in having the electric drive fitted to the work to be done in the mill. There should soon be available a greater amount of data on mills using electric reversing drive, inasmuch as there are now at least 20 mills operating or in course of construction in this country. Data from these mills, when made available, will be of much assistance to electrical engineers and manufacturers in selecting proper equipments for any mill which may be under consideration.

Electric Power in Steel Industry

Increasing Use of Electricity in Steel Mills Due to Recent Installations of Motor Drives, Electric Furnaces, etc., Has Emphasized the Need of Economy in the Generation of Power

BY BRENT WILEY

WHILE it is true that even a decided improvement in the economy of the power required to produce a ton of steel in the finished state would vary its total cost only a fraction of a per cent, as considered from past practice—this item is fact becoming a more serious one. Changing conditions are materially increasing the power cost. The supply of natural gas is giving out rapidly in many localities which formerly found it a cheap fuel, and the price of coal is correspondingly increasing. The question of transportation together with the increased demand for coal has added serious problems to the plant's management list. Today a maximum effort is being made to utilize every available heat unit to the best advantage, and every steel plant should thoroughly review its conditions to see that its practice is producing the best results.

Many phases of economical power generation developed during the past 10 years which have cleared up obstacles to fairly well established conclusions, might well be reviewed here to discover to what further extent they could be modified and employed advantageously in various plants.

It is important to emphasize the value of planning for future developments, for in order to meet the rapidly increasing demands of the steel industry successfully, the electrical

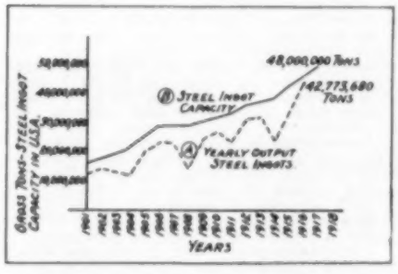

FIG. 1—OUTPUT AND CAPACITY OF STEEL INGOTS

power engineering must pursue a broad policy.

During the earlier periods plant area was rather limited and the distribution of 250-volt direct current power to the auxiliary machines was easily provided for (generally within a radius of 2000 feet). The requirements of the station were small and plant improvements called for additional power in limited amounts. The power station usually consisted of two or more units ranging from 200-kilowatt to 750-kilowatt capacity. These units were in many cases driven by slow speed engines—125 pounds steam pressure—noncondensing, and speeds ranging from 125 to 200 revolutions per minute. A steam consumption of 35 pounds per kilowatt hour was considered fair practice. No comprehensive design of power plant was considered necessary, and as a result the station just grew. Even today there are but few plants where the majority of power is used for auxiliary machines which are composed of modern generating units, installed in accordance with broad engineering principles. On the contrary, power plants, in general, are composed of a number of comparatively small and inefficient units.

Gas Balance

500-ton (net) blast furnace—using 2100 pounds coke per ton of pig iron.
Gas per hour, 3,120,000 cubic feet.
Average heat value of gas, 90 B.t.u. per cubic foot.
Boiler efficiency, 75 per cent.

	Steam engines, per cent	Turbo blowers, per cent	Gas engines per cent
Blowing engines	30.0	14.0	11
Condenser aux..	1.5	2.0	*
Other aux.	1.5	1.5	*
Cooling water..	5.0	4.5	*
Stoves	30.0	30.0	30
Total required for furnace...	68.0	52.0	41
Surplus gas....	32.0	48.0	59

*Included in Item No. 1.

One of the first factors which developed marked improvement in power plant engineering, as relating to the larger mills, was the rapid growth of steel capacity. With the increase in size of plants and amount of power required, alternating current power was adopted; approximately 20 years ago. The higher voltage greatly simplified transmission problems and the larger capacity and high speed type of generating units gave increased economy. Curve *a*, Fig. 1, gives the steel ingot output since 1901, while curve *b* estimates the steel-making capacity of the mills of this country. According to the latter, the steel capacity has doubled within the last 12 years, being at present 48,000,000 tons per year. A curve similar to *b* could be plotted to show the increase in auxiliary motor load requirements, using the following general basic data:

Total horsepower of auxiliary motors installed per year ton steel ingot capacity, 0.025 horsepower. This amount includes power for the blast furnace department.

Generating apparatus installed per horsepower auxiliary motors, 0.15 kilowatt. Spare unit is not included.

With the advent of motor drive for the main rolls which became a real factor approximately 10 years ago, the electric power plant began to receive serious consideration by the management of those plants directly interested in this application. For every horsepower of main roll motor drive it requires approximately 0.5 kilowatt generating capacity which is about three times that necessary for a horsepower of auxiliary motors. Fig. 2 shows the yearly installation of main roll drives from 1905 to Jan. 1, 1918, installed. A very close estimate can be made for the 1917 total as the question of delivery practically limits the installed units to the total included in sales to July 1,

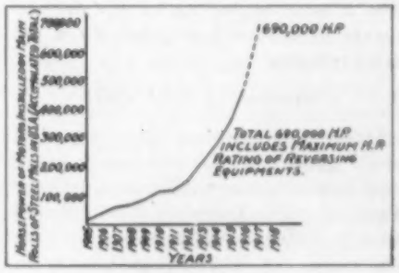

FIG. 2 — INSTALLATIONS OF ROLL DRIVES FROM 1905 TO 1917

1917. During the last five years the total horsepower installed has increased 400 per cent.

A third factor which is rapidly increasing the demand for electric power in the steel industry is the electric furnace. There were 36 furnaces of approximately 191 net tons capacity

From a paper presented at the eleventh annual convention of the association of Iron and Steel Electrical Engineers, Philadelphia, Sept. 10 to 14.

installed in the United States Jan. 1, 1916, requiring 40,000 kilowatt amperes (90 per cent power factor) generating capacity. Curve *a* of Fig. 3 shows the growth of furnace capacity since Jan. 1, 1916, and curve *b* gives the generating capacity required. Estimates have been made for the last half of this year, based on sales made to July 1, 1917.

Summarizing the power requirements of these three factors, regarding generating capacity required, we have the following data—in terms of average rate of yearly increase:

DEC. 31, 1905-1909

	Kilowatts
Auxiliary motors	5,000
Main motors	10,000
Electric furnaces	.....
Total	15,000

DEC. 31, 1909-1913

	Kilowatts
Auxiliary motors	10,000
Main motors	16,000
Electric furnaces	4,000
Total	30,000

DEC. 31, 1913-1915

	Kilowatts
Auxiliary motors	13,000
Main motors	25,000
Electric furnaces	12,000
Total	50,000

DEC. 31, 1915-1917

	Kilowatts
Auxiliary motors	20,000
Main motors	75,000
Electric furnaces	75,000
Total	170,000

A composite curve, shown in Fig. 4, shows the growing demand for electric power and it is of particular interest to note the unusual increase given in the past two years. This rapid increase in the scope of application of electric power and amount required makes the generation of power a more and more important question, particularly from the standpoint of economy. It would be well to analyze this point as applying to various steel plant conditions and give a general outline of the several phases of economy as adopted in existing plants.

Utilization of Heat Units

The broad problem of economical power generation for practically every steel plant work today includes the study of one or more of the following points: Proper utilization of the heat units of coke oven gas from the coke plant—blast furnace gas in pig iron production—and waste gases form open-hearth and re-heating furnaces.

Coke-oven gas is used as a fuel under boilers for the generation of steam, for open-hearth furnace work, reheating furnaces, and in a number of cases used in gas engines for the direct generation of power. Blast furnace gas is used under boilers and in gas engines to furnish air for the blast furnaces and also electric power for outside purposes.

A great deal of experience has been gained by a number of steel plants during the last several years in the

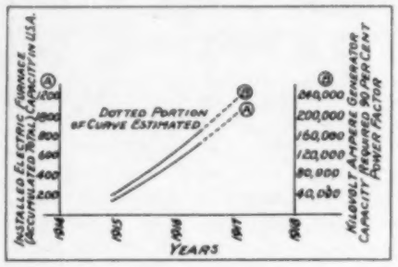

FIG. 3—GROWTH OF FURNACE CAPACITY AND ELECTRIC GENERATION REQUIRED

generation of steam from boilers, utilizing the heat from the waste gases from open-hearth furnaces and re-heating furnaces. It seems probable that the steel plant of the near future, consisting of coke plant, blast furnace, open-hearth, and rolling mill departments will be so designed that the several advantages offered by each phase of heat economy will be so coordinated that no fuel will be burned directly under boilers, and in addition to furnishing all the power required by the plant operation—a fair percentage will be available for sale.

The gas balance in a 500-ton furnace plant is approximately as given in the table on page 547.

There is so much variation in the conditions existing in different plants that no attempt will be made to work out a concrete case with fixed conditions. It seems more practical to

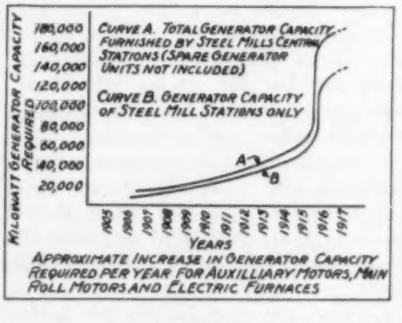
Curve A. Total Generator Capacity Furnished by Steel Mills Central Stations (Spare Generator Units not Included)
Curve B. Generator Capacity of Steel Mill Stations Only
Years
Approximate Increase in Generator Capacity Required per Year for Auxilliary Motors, Main Roll Motors and Electric Furnaces

FIG. 4 — GENERATION CAPACITY OF STEEL MILLS AND CENTRAL STATIONS

treat the subject in a general way and give comparative data.

	First cost per cent	Operating cost per cent
Gas blowing engines—gas engine driven electric units.	100	100
Gas blowing engines—Turbo generators (complete engine equipments, including auxiliaries)	60	80

These figures are based on modern gas engine units, 4000-kilowatt capacity and 10,000-kilowatt turbo generators to operate under modern conditions, steam pressure, superheat and vacuum. The same amount of electric power is generated in both cases and coal at $2.50 fired is to be used to produce the extra steam power required by the turbo-generator units.

A considerable further saving in first cost and cost of operation can be obtained by the installation of turbo-blowers in the place of gas engine blowing units, this being approximately 20 per cent and 30 per cent, respectively.

Allowing for Surplus Gas

Practice shows that 1 kilowatt-hour of power can be generated for approximately 230 cubic feet of gas by a turbo-generator unit and by a gas engine unit for 190 cubic feet of gas. It should be noted that a liberal percentage of margin is necessary in estimating the amount of surplus gas available for power purposes, to allow for variation of furnace conditions, and number of furnaces in operation. For a three or four furnace plant this item should be approximately 20 per cent.

A large number of steel plants have adopted the practice of installing waste heat boilers on open-hearth furnaces and by a careful analysis of the experience gained during the last seven years many improvements have been devised. Very interesting data are contained in a paper written by Charles J. Bacon and read before the American Iron and Steel Institute in 1915. The following statement of savings is taken from this paper:

1600 to 2000 pounds steam per ton of ingots.
50 to 65 boiler horsepower-hours per ton.
65 to 90 boiler horsepower-hours per ton per 1000 pounds of coal (11,000 B.t.u. per pound) charged in gas produced.

If the open-hearth fuel were natural gas, the boilers would generate about 85 per cent as much steam as with coal, due to less weight of products of combustion.

There is an opportunity for improvement in new installations by means of larger boilers and more attention to reducing the heat losses resulting from air leakage and radiation in the regenerative chambers, valves and flues. It is reasonable to expect that the following results can be obtained, though due allowance should be made for average conditions:

Size of heat—75 tons.
Time of heat—10 hours.
Hot metal in charge, 64 per cent.
Ratio, product to charge, 88 per cent.
Fuel consumption, 4875 pounds per hour, or 650 pounds per ton.
Heat value of coal, 10,700 B.t.u. per pound.
Weight waste gases at boiler, 81,400 pounds per hour.
Carbon dioxide in waste gases at boiler, 12 per cent.
Temperature waste gases at boiler inlet, 1200 degrees Fahr.
Temperature waste gases to stack, 500 degrees Fahr.

Performance of boiler under above conditions, 460 boiler horsepower (150 pounds steam pressure—100 degrees Fahr. superheat, estimated).

As a summary of the several factors that warrant the careful consideration

of every steel mill engineer regarding the economy of generation and use of power, it may be stated that the general trend of the times is to use waste gases under boilers as fuel or to absorb a large portion of their latent heat direct. The steam thus produced may be used in large sized turbines for the generation of electric power and the mill equipped universally with motor drive. The electric furnace should be adopted for special steels.

The steel mill electric power load is becoming more and more favorable regarding amount, load factor, and power factor, and consequently is more desirable from the central station companies' standpoint. At least 75 per cent of the electric furnace load is on central station lines and the percentage of main roll motor load is increasing rapidly. The future possibilities of greater benefits to both parties concerned are definitely established as indicated in Fig. 4.

It is again suggested that more consideration be given to the establishing of a technical data bureau so that a definite analysis can be made for present and future improvements in plant conditions. Unnecessarily large safety factors generally result in loss of economy and are particularly difficult matters to dispose of in power contracts with seemingly equal equity to both parties. The various details of electric power requirements for various types and sizes of mills should be compiled in detail form.

The data previously given show conclusively that the steel plant electrical requirements are growing much more rapidly than has been experienced in the past—approximately in the ratio of 2½ to 1. The advantages offered are becoming more pronounced each year, and naturally the question of future plant improvements brings up the points—when will they start and to what extent will motor drive be applied? These subjects should, as a rule, be considered jointly, for the actual value of motor drive is seldom realized until it is a part of a complete electrification. Thus, a broad engineering policy with responsibility for carrying out a plant-wide improvement is worthy of consideration in the majority of mills.

There have been cases where on first analysis the electrification of only one new mill showed but a moderate return on the investment required. However, when further mill improvements were included in the estimate, the economy of operation was greatly increased. The power station first-cost was materially reduced per unit; the increase of load factor increased the working capacity of a unit of power, thus reducing the proportional cost of station; large size generator units with more uniform load tended toward better economy of operation and existing boiler plants, low economy engines, long pipe lines and various other items which were responsible for high operating costs, could be practically eliminated.

Quite often it is necessary to consider changes upon very short notice and if plans have previously been laid to include the proper improvements, these can be provided with less confusion and with the assurance of obtaining the best arrangement.

U.S. Steel in Canada

Corporation Resumes Work on Its Plant at Ojibway

After several years of waiting the United States Steel Corp. is resuming work on its plans for a big plant at Ojibway, Ont., across the river from Detroit, according to Ward B. Perley, vice president of the Canadian Steel Corp., subsidiary of the United States company. Advertisements are now being published for the construction of a slip and concrete and steel docks to cost $250,000. The entire plant, according to Judge E. H. Gary's announcement several years ago, will cost $20,000,000. It has not been said what readjustments in plans are to be made on account of the great increase in costs. During the past year Mr. Perley and Lamont Hughes, superintendent, and a staff of engineers have been on the ground revising plans, including the laying out of a town site two miles square along the river.

The canal, which will be dredged into the company's property, will be 200 feet wide and 2500 feet long, with docks along each side.

The Steel Corporation first established a Canadian connection about 15 years ago. In 1907 the Ojibway site of 1650 acres was acquired. It is thought the plant will have the double purpose of sharing in Canadian domestic trade and taking advantage of the trade with foreign countries with which Canada will have preferential tariff arrangements after the war. There is much speculation on the attitude of the big Canadian steel interests toward the new concern, and it is thought the prospect of new competition may lead to amalgamation.

The gas producer house and railroad trestle at the plant of the C. Pardee Works, Perth Amboy, N. J., were badly damaged by fire Sept. 5.

To Export Steel

American International Steel Corporation Formed in New York

Another powerful organization has been formed to sell American steel and steel products, to all portions of the inhabited globe. This is the new American International Steel Corp., just formed as a subsidiary of the American International Corp. Edward M. Hagar, for many years president of the Universal Portland Cement Co., has been elected president, and the new company has headquarters at the general offices of the parent corporation, 120 Broadway. Offices already have been established in London and Buenos Aires and additional offices will be located without delay in Spain, Italy, France and Australia, and further expansion will be carried on as rapidly as is consistent with the development of the organization as a whole. Considerable business already has been booked by the American International Steel Corp., involving orders for all kinds of steel products. The most unusual contract which it so far has secured is one involving 100 bridges for military and reconstruction work in Belgium. These bridges will be placed over railroads and canals in that devastated country. Each of them will be 43½ feet long and will be made after one design; this business recently was placed with the McClintic-Marshall Co. Other business, so far obtained by the new corporation, has been booked mainly from China, Australia, Argentine, France, Java and Russia.

Gain of Fifth in Coal

The number of cars of bituminous coal handled by the railroads in July this year was a fifth larger than the amount handled in July, 1916. This increase, says the railroad's war board, amounted to 6,486,000 tons. The total number of cars handled in July was 764,965. For the four months ending in July, or the period after the roads agreed to merge their competitive activities, the amount of bituminous coal handled was a fourth larger than in the corresponding quarter of 1916.

The United States government has ordered the Strong, Kennard & Nutt Co., Cleveland, to make 360,000 pairs of its new reinforced lenses to be used in gas masks and aviators' goggles. The order includes a demand for the entire output of this product until the required number are furnished. It is estimated that this work will take until November to complete.

Republic's New Furnace at Haselton

Four 1262-Horsepower Boilers in Unusually Adequate Power Plant—Single Turbo-Blower Supplies the Three Hot-Blast Stoves—Small Checkers Used —Bells Operated by Steam Electrically Controlled

MODERN design, indicating unusually careful handling of the details influencing furnace maintenance and operation, stamps the 600-ton blast furnace recently completed by the Republic Iron & Steel Co., Youngstown, O., as a notable installation. The new stack, which constitutes the fifth unit of the Haselton group, was blown in Aug. 27, 1917.

The stack, 95 x 22 feet with a 17¾-foot hearth and a 16½-foot stockline, rests upon a mantle ring supported by eight water-cooled cast-iron columns. These columns are built in the solid concrete foundation and are amply strengthened by two lower steel segmental hearth jackets.

Seven rows of wedge-shaped cooling plates and 12 tuyeres and coolers are employed to keep the bosh cool. The bosh is reinforced by a heavy cast-steel jacket. Above the mantle seven rows of iron plates are used to protect the top of the bosh. These plates are triple-fed with water from the main manifold, which winds around the furnace just below the mantle ring. Water is supplied to this manifold by 10-inch high and low-pressure lines, each containing a triple basket-screen filter. The manifold feeds a 6-inch secondary manifold which encircles the bosh at the level of the first row of plates above the tuyeres. All tuyeres, coolers and bosh plates are supplied from the secondary manifold, the tuyeres being fed and discharged at the side and the coolers fed at the bottom and discharged at the top. Each cooler is held in place by a 2-inch steel bar screwed into a lug which is attached to the bosh band directly over the cooler. The bosh plates are piped with 1-inch stock and connected in a zigzag manner.

The cast house, 38 x 105 feet, faces the south. It is spanned by a 35-ton crane, built by the Alliance Machine Co., Alliance, O., the auxiliary and heavy-duty drums being operated by 7½ and 25-horsepower motors, respectively. Five 42½-ton or seven 25-ton iron ladles can be spotted on the hot metal track which extends along the west side of the cast house. The Vaughn type clay gun is used to stop the iron notch. It is held in place by steam-operated "dogs". A material track is located at the end of the building. Coke dust, sand, etc., is removed from the cars into scoop-shaped containers which are hoisted by the crane and conveniently placed along the side of the building near the iron runners.

A Killeen type of skimmer is employed to separate the slag from the iron during the cast. Provision has been made to handle the slag either in the molten or granulated condition, although the granulated process is being used. The slag runs into a 14 x 30 x 27-foot pit, one side and end of which is bricked to the top of the building. This eliminates the steam from the cast house when the furnace is casted or flushed. All cinder accumulating on the furnace platform is shoveled into the cinder pit through a door in the wall on the cinder-notch side. The granulated slag is scooped out of the pit by means of a clam-shell bucket and loaded into hopper cars placed directly under an electric crane. This traveling crane which has a span of 17 feet and a travel of 210 feet, is electrically operated. The main hoist is served by a 40-horsepower motor and the traveling unit by a 35-horsepower motor.

The trestle, 34 x 302 feet, is of concrete construction and supports three standard-gage tracks. Hopper cars loaded with ore are placed on the outside track and emptied, the ore falling on baffles which direct it away from the trestle. It is then transferred to the stockpile by means of a 10-ton grab bucket which travels on an overhead girder bridge. This bridge, 74½ x 147 feet, was erected by the Brown Hoisting Machinery Co., Cleveland.

Ore and limestone for immediate use are unloaded from cars spotted over the bins on the middle track. The ore bins can be replenished from the stockpile by means of the ore bridge and an electrically driven hopper-shape transfer car. The inside track is used for the coke train which extends to the extreme end of the trestle. When the coke supply in the bins becomes low, one car at a time is moved forward over the coke bins, where it is dumped. Three hop-

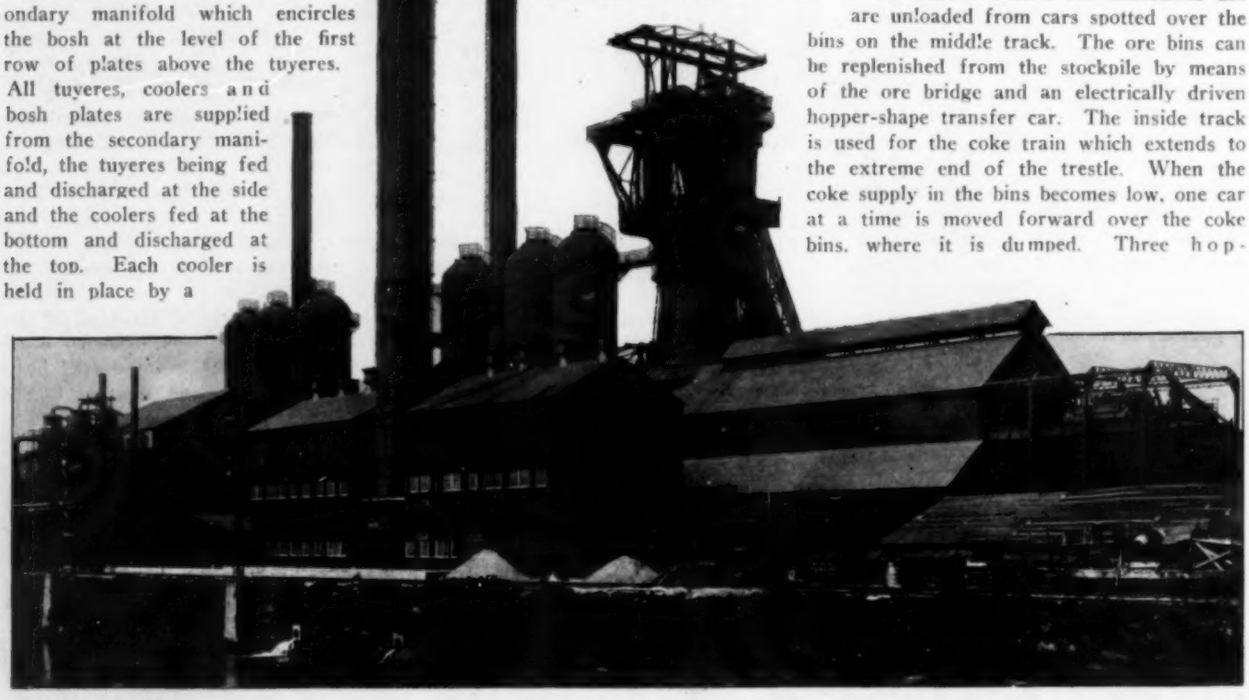

FIG. 1—VIEW OF NEW HASELTON FURNACE, REPUBLIC IRON & STEEL CO., SHOWING ARRANGEMENT OF FURNACE TOP

per-shaped coal bins are located beneath this track at the south end of the trestle. It is from these bins that the yard locomotives receive their supply of coal.

All ore and stone bins are of the McKee suspension non-pocket type. Ten are placed to the right and five to the left of the skip pit. They are constructed of rolled steel plates and are suspended from reinforced concrete girders. Each bin is equipped with 10 lever-type continuous doors. Ore-sticking is alleviated by having the doors of each bin placed 18 inches from the center line of the ore track above. The scrap bin is protected against any severe wear, as it is lined on the bottom with steel rails placed 2 inches apart.

Stockhouse Equipment

Material is discharged from the bins into an electrically operated larry car equipped with safety fenders and a 10-beam scale. Two larries are provided. Each car is driven by a 25-horsepower motor made by the Westinghouse Electric & Mfg. Co., Pittsburgh. The motor has a speed of 575 revolutions per minute. A signal lamp is conveniently placed in full view of the larry car operator, and when lighted informs him that the skip is ready to receive its load. The light is operated by the skipman. After the material is emptied from the larry into the hopper feeding the skip, the bottom-drop door of the car is closed by a low-geared hand wheel.

The coke bins are arranged on both sides of the skip runway. The volume of coke fed to the skip is governed by a lever-controlled gate. Inserted in the coke chute is a screen over which the coke passes when in transit to the skip. The coke breeze passing through this screen is caught in a secondary chute which empties onto an endless cup elevator. This elevator, which is operated by a 5-horsepower motor, discharges into a bottom-door hopper located under the skip bridge and over the dust catcher track. The coke breeze is used at the soaking pits and furnace front. The skip pit is supplied with a 6-inch steam syphon.

Stock is sent to the top of the furnace by two skips running alternately up a skipway of the cantilever type. The skips are operated by a hoisting drum made by the Lidgerwood Mfg. Co., New York, driven by a 220-volt motor with a speed of 240 revolutions per minute. All equipment, including an instrument board and a monorail crane, is housed in a well-ventilated and lighted brick building at the left of the skip bridge.

The skip operator's station, located at the right of the skip tracks, con-

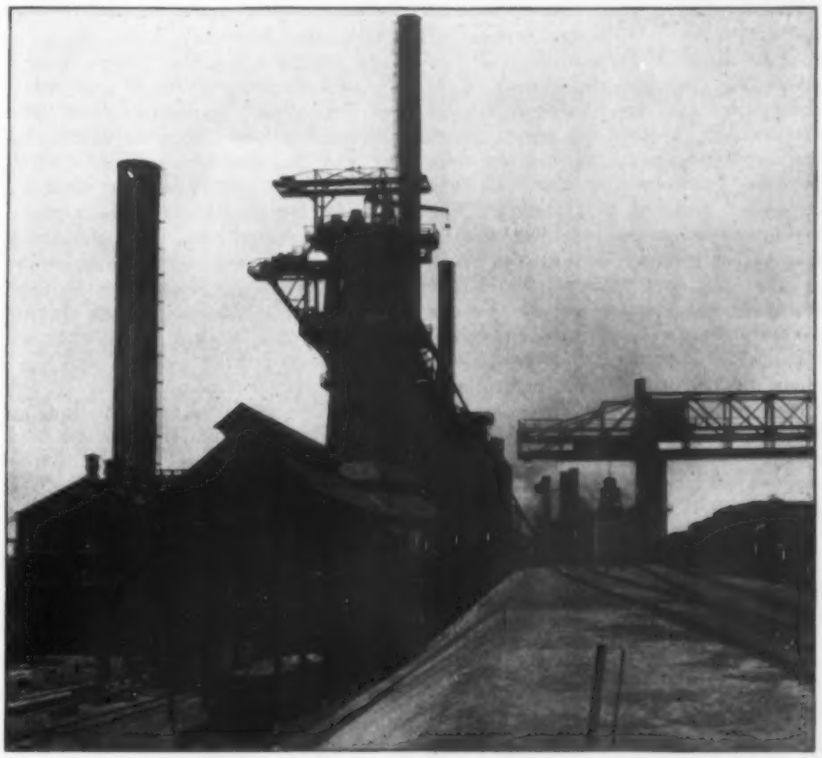

FIG. 3—VIEW OF FURNACE SHOWING CAST HOUSE, GRANULATING PIT AND TRESTLE IN THE FOREGROUND

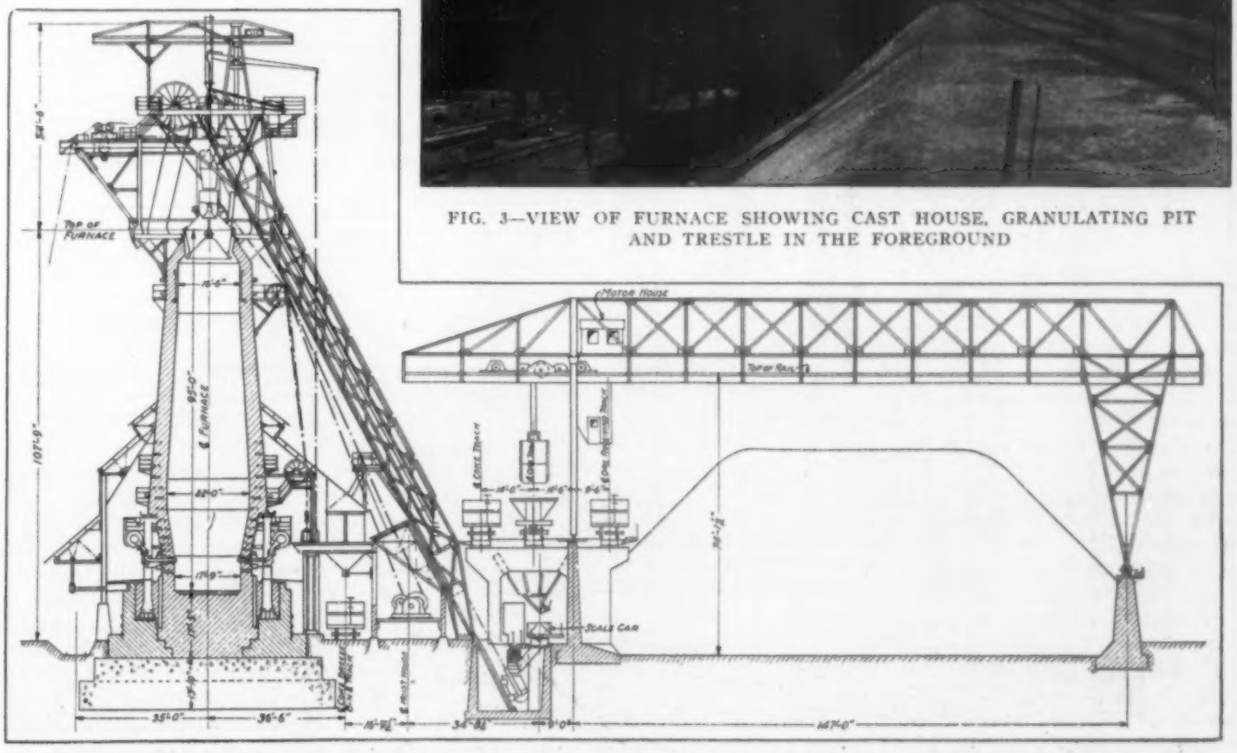

FIG. 2—ELEVATION OF NEW FURNACE SHOWING ARRANGEMENT OF SKIP, BINS, TRESTLE AND ORE BRIDGE

tains the electrical devices used in operating the bells, skip hoist, revolving top, coke breeze, elevator, etc.

The skip cars discharge into a rolled steel hopper which feeds a cylindrical motor-driven hopper of the McKee type. The double bell system operated by steam but electrically controlled, delivers the stock into the furnace. The bell cylinders are supported by a platform suspended from the skip bridge and underneath the cast house roof. This arrangement gives convenient access to the steam cylinder lines and avoids the freezing to which the pipes would be subjected if located on the top of the furnace.

Repair platforms are placed around the bell levers. A bridge supporting a crane used in dismantling the top mechanism or for minor repairs, is constructed on the extreme top of the furnace. A davit, the top of which can be swung over the furnace side, is used to hoist or lower all top apparatus required for relining. The top inwall is internally cooled by cast-iron plates inserted in the brick work at the stockline. These plates are supplied with water at 75 pounds pressure by two pumps each driven by a 75-horsepower motor with a speed of 1750 revolutions per minute.

The waste gas is led above the furnace top by four uptakes, 90 degrees apart. Downcomers lead from the junction of each two pipes and converge just outside a 25 x 30-foot centrifugal dust-catcher. A bleeder extends upward from the junction of the two uptakes on the stove side of the stack. Issuing from the top of this vessel the gas is conducted by a riveted steel gas main 99 feet long to a Brassert gas washer and "sow" drier. This main supports five triangular shaped hoppers with bottom-drop doors through which all entrapped dust is loaded into cars. Two windlass-type goggle valves are inserted in this main, one after the dust catcher and one before the gas washer. A by-pass line in the rear of the No. 3 stove extends from this main to the washed-gas main leading to the stoves and boilers.

Three 2-pass stoves, 22 x 102 feet, attend the furnace. Each stove is built around 3½-inch checkers heated by two Birkholz-Turbeck gas burners. Gas is by-passed from the common main to a receiver that forms the base of each gas burner. Each receiver is supplied with a cleaning door for the purpose of removing any entrained water that is carried over from the gas washer. The products of combustion are exhausted through two chimney doors into an underground tunnel leading to the chimney between Nos. 1 and 3 stoves.

The boiler equipment ranks as one of the largest furnace installations in the world. The battery, housed in a building 165½ x 42 feet, contains four 1262-horsepower vertical boilers, each fed by nine Birkholz-Turbeck circular gas burners equipped with 6-inch peepholes in the rear.

The blowing equipment consists of two turbo-blowers, built by the General Electric Co., Schenectady, N. Y., rated at 7000 horsepower each at 175 pounds per square inch steam pressure. One blower supplies the volume of blast necessary for the new furnace, while the other is held in reserve. Each compressor operates at from 3000 to 3600 revolutions per minute, the air pressure varying from 18.6 pounds per square inch to 31 pounds maximum. The air delivered against 30 pounds per square inch pressure is 60,000 cubic feet. Both engines are equipped with an automatic regulator which assures a constant volume of air immaterial of any change in the humidity or barometric pressure of the atmosphere.

Both compressors operate condensing, the average vacuum being held approximately at 27 inches by two vacuum pumps built by Ingersoll-Rand, New York. Two jet condensers, made by the William Tod Co., Youngstown, O., are provided, which lower the steam consumption of the turbo-blowers and afford a double air extraction. The larger portion of air is removed at low temperature and increased pressure which lessens the work of the vacuum pump. The blowing room, 53 x 60 x 50 feet, is constructed of brick and contains a 20-ton crane built by the Alliance Machine Co., Alliance, O.

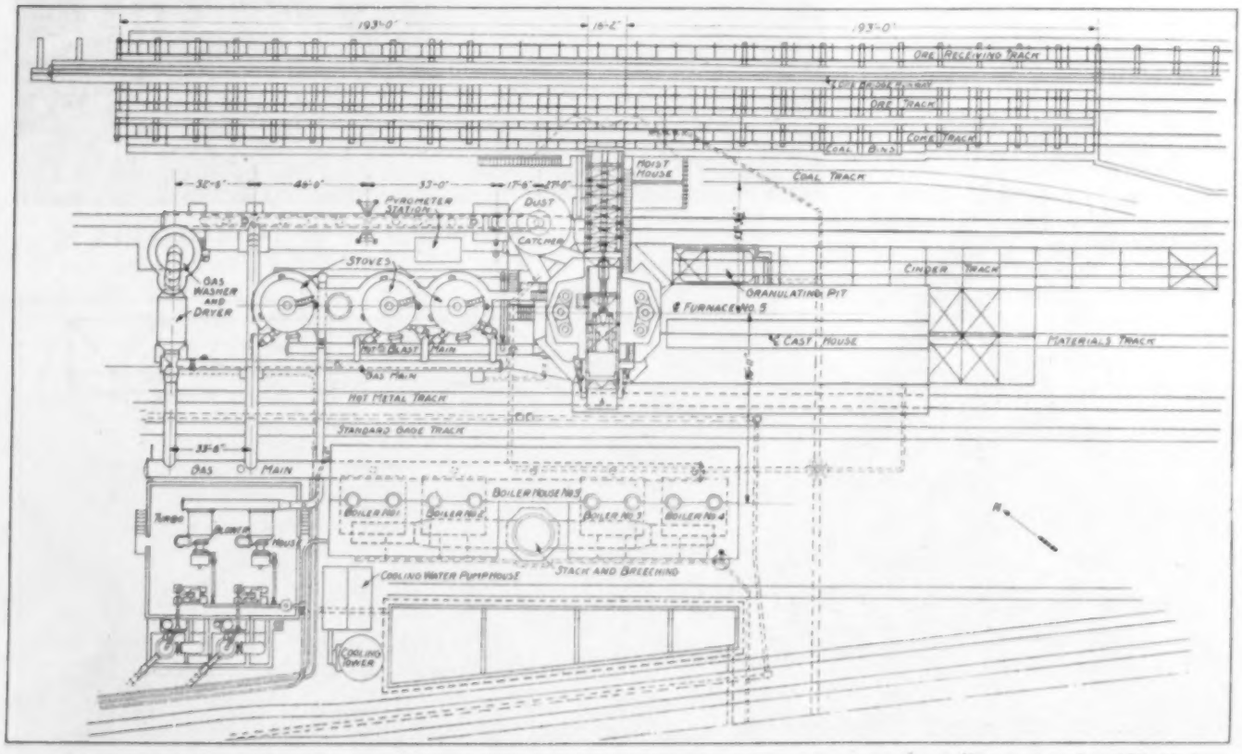

FIG. 4—PLAN VIEW OF STACK, STOVES, GAS WASHER, BOILERS, BLOWING ROOM, CAST HOUSE AND TRESTLE

Phenol is Active

Benzol, by Contrast, is Quiet—Naphtha Weak

New York, Sept. 11.—Much activity in phenol, both consummated and impending, now is the principal feature of the coal tar products' market. Large purchases of phenol have been made during the past week by domestic consumers and additional large domestic requirements still are pending. Some foreign demand also was satisfied during the week but this did not involve unusual proportions. A large foreign contract, however, now is under negotiation and is expected to be closed without delay. As a result of recent business, spot phenol is scarce and the market is strong. Current quotations are 42 to 45 cents per pound, at producer's plant, for spot shipment and approximately 42 cents for contract shipment.

Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.53 to .60
Toluol	1.70 to 1.80
Solvent naphtha	.16 to .18

Per Pound at Producers Plant.

Phenol	$0.42 to .45

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$4.85 to 5.00

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.50 to .55
Toluol	1.50 to 1.80
Solvent naphtha	.16 to .18

Per Pound at Producers Plant

Phenol (nominal)	$0.42

Per 100 Pounds at Seaboard.

Sulphate of ammonia	nominal

Benzol, in contrast to the recent heavy buying, has been quiet this week. The market continues exceedingly strong, however, and pure benzol may be quoted at 53 to 60 cents per gallon at producer's plant for spot shipment, and at around 50 to 55 cents for contract shipment. Toluol has experienced a week of inactivity so far as actual business is concerned. There is a large unsatisfied demand comprising many inquiries both from the government and from companies manufacturing trinitrotoluol for the government. These requirements are difficult to place, owing to the sold-up condition of the market. Toluol may be quoted at $1.70 to $1.80 per gallon at producer's plant for spot shipment, and at $1.50 to $1.80 for contract shipment.

Solvent naphtha has been difficult to move lately and stocks tend to accumulate. The market is weak at approximately 16c to 18c per gallon at producer's plant both for spot and contract shipment. It is likely that as low as 15c might be done on an attractive quantity. New inquiry for sulphate of ammonia has been of smaller proportions than usual, of late. Due to the sold-up condition of the market, however, the situation continues strong. Spot sulphate of ammonia continues to be quoted at $4.85 to $5 per 100 pounds at tidewater.

Obituaries

Albert S. Fears, treasurer of Reed, Fears & Miller, Inc., Boston, died recently.

Albert W. Chapman, New York manager of the Wright Iron Co., Worcester, Mass., died from pneumonia, Sept. 6, at his home in Brooklyn, aged 66.

Howard Valentine, of R. N. & H. Valentine, for many years a leading figure in the New Jersey fire clay industry, died at his home in Woodbridge, N. J., Sept. 5, aged 70.

Lon Weston, president of the Tuck Mfg. Co., Brockton, Mass., maker of small shop tools, died at his home in that city, Sept. 5, aged 83 years. He organized the company in 1879 and has since been at its head. Mr. Weston had served the city as alderman, and for more than 23 years was trustee of the Brockton Public library. He also was vice president of the Peoples' Savings bank, Brockton.

Albert William Chapman, New York sales manager for the Wright Wire Co., Worcester, Mass., died at his home in Brooklyn, N. Y., Sept. 6, of pneumonia, aged 66 years. He had been with the Wright Wire Co. for 15 years and also with the Clinton Wire Cloth Co., Clinton, Mass., previous to which time he traveled in New England. He formerly was widely known in the hardware trade of that section.

Albert S. Smith, one of the pioneer machine tool builders of Cincinnati, died of heart failure at his home in that city recently. He was 59 years old, and came to Cincinnati at the age of 17, entering the employ of the John Steptoe Co. In 1888 he formed a partnership with the late James Mills and established the Smith & Mills Co., making a specialty of shapers. He was a member of several business and civic organizations, including the Cincinnati Business Men's Club.

The Edward Valve & Mfg. Co., Chicago has increased its capital from $1,000,000 to $1,500,000.

Few Sales

Of Refractories Being Made—Makers Well Booked—New Orders Scarce

Pittsburgh, Sept. 11.—Demand for fire clay brick is more active than it is for silica. The refractories producers are well filled up with orders, some having contracts for eight months ahead. Recent orders have been placed principally by steel, boiler and glass manufacturers. Numerous inquiries for various kinds of refractories are out, but some of the producers are unable to consider them. Prices remain unchanged. Production of refractories is considerably curtailed by the unsatisfactory labor situation.

Refractories

(Per 1000 f. o. b. works.)

FIRE CLAY BRICK.
(First Quality.)

Pennsylvania	$45.00 to 55.00
Missouri-Illinois	45.00 to 55.00
St. Louis, high grade	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK.
(Second Quality.)

Pennsylvania	$40.00 to 50.00
Ohio	37.00 to 40.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESIA BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$135.00 to 160.00

CHROME BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$125.00 to 135.00

BAUXITE BRICK.
(Per Net Ton.)

55 per cent.	$40.00 base
76 per cent.	100.00 base

It is particularly bad in the Clearfield district.

Organization Perfected

The Merchant Shipbuilding Corp., which is about to undertake the construction of 40 ships at its plant at Bristol, Pa., as agents for the Emergency Fleet corporation, has been organized as follows: Chairman of the board of directors, W. A. Harriman, 165 Broadway, New York; president, R. H. M. Robinson, 165 Broadway, New York; vice president and comptroller, C. B. Seger, 165 Broadway, New York; vice president, C. W. Hamilton, 50 Broad street, New York; general manager, W. T. Smith, Finance building, Philadelphia; consulting engineer, C. P. M. Jack, Finance building, Philadelphia; and engineering manager, Max Willemstyn, Finance building, Philadelphia.

Huge War Expenditures Proposed

A Total of Nearly $7,000,000,000 Asked in Latest Bill Presented in House—Most of the Money Will Be Spent in the Iron, Steel, Machinery and Shipbuilding Fields

WASHINGTON, Sept. 11.—War expenditures aggregating $6,600,000,000 are now awaiting action by congress. Of this huge sum, $4,810,919,370.29, chiefly for army and navy requirements, was recommended and presented in a bill by the appropriations committee of the house last week. The remainder, approximately $1,800,000,000, is now under consideration by the committee on requests from the army and navy departments and the shipping board. In the bill offered last week, providing for the greatest single appropriation ever proposed in this country, $3,503,480,142 is requested for the army for immediate expenditure and contract authorizations for $1,035,000,000 more are asked. The navy asks only $263,264,480 and the balance, $9,284,748.29, is distributed among requests from various other government departments.

No sooner had the appropriations committee introduced the bill in the house than it went back to its room and began immediate study of the new requests. These proposed appropriations include the $350,000,000 Secretary Daniels has asked for immediate construction of 150 torpedo-boat destroyers which are to be of a standard type. Of this, the secretary desires $225,000,000 in cash and $125,000,000 in contract authorizations. Consideration is also being given Chairman Hurley's request for $1,134,500,000 additional for the shipping board, $915,000,000 of which is needed at once, $400,000,000 for the building program, $365,000,000 for commandeering, and $150,000,000 for purchase of ships. The army wants $309,692,750 additional, of which $168,020,000 is to purchase automatic machine guns, $130,672,750 for armament for fortifications, and $11,000,000 for small arms target practice.

Big Ordnance Appropriations

The principal army items in the appropriation bill reported last week include: mountain, field and siege cannon, $676,213,000; ammunition for these cannon, $663,000,000; pay of the army, $370,126,820; transportation of army and supplies, $350,000,000; clothing and camp equipment, $350,000,000; army subsistence, $175,000,000; artillery maintenance, $155,600,000; machine rifles, $120,277,000; quartermaster supplies, $100,000,000; medical and hospital department, $100,000,000; engineer field operations and equipment, $108,000,000; ordnance stores, $70,000,000; barracks and quarters, $49,155,000; small arms ammunition, $41,520,000; hospital construction and repair, $35,000,000; horses, $30,000,000; water and sewer installation, $23,886,500; armored motor cars, $16,750,000; armories and arsenals, including $3,000,000 for new proving grounds, $17,344,200; submarine base at Panama canal, $902,625; submarine mines and nets, $700,000; machinery for rifle manufacture, $9,500,000; roads, walks and wharves, $12,000,000; shooting galleries and ranges, $6,014,540; signal service, $3,000,000; and additional protection for Panama canal, $458,200. The contract authorizations for the army include: armory and arsenal terminal facilities, $5,000,000; machine guns, $50,000,000; armored motor cars, $5,000,000; mountain, field and siege cannon, $225,000,000; ammunition for these cannon, $700,000,000, and artillery maintenance, $50,000,000.

The navy requirements for which appropriations were recommended include: Naval emergency fund, $100,000,000; aviation, $35,000,000; reserve ordnance supplies, $30,000,000; ammunition for vessels, $25,000,000; batteries and outfits for vessels, $22,000,000; ordnance and ordnance stores, $12,446,480; transportation, $700,000; enlarging Washington navy yard gun factory, $7,500,000; maintenance yards and docks, $1,500,000; marine corps clothing, $2,650,000; marine barracks, $500,000; improving ordnance stations, $2,250,000; hospital construction, $1,000,000; engineering expenses, $10,000,000; marine railways, $375,000; constructing and equipping training camps, $6,000,000; handling appliances at yards and stations, $450,000; contingent expenses of bureau of yards and docks, $1,000,000; maintenance of bureau of supplies and accounts, $4,500,000; to complete Porto Rico radio station, $200,000; recreation of enlisted men, $150,000; additional instructors at naval academy, $18,000; civilian naval

The bill reported last week authorizes expenditures in our behalf in prosecution of the war. The great war credits bill of $11,538,945,460, not only puts at the disposal of our own war offices more funds but permits the treasury department to lend an additional $4,000,000,000 to our allies. The credits bill passed the house without a dissenting vote, after a futile fight had been made to authorize congressional supervision of war expenditures, and is now under consideration by the senate committee. Of the total bonds authorized, $7,538,945,460 is in convertible 4 per cent bonds, subject to tax, $4,000,000,000 of which is for the allies. $3,000,000,000 to take over a 3½ per cent issue already authorized, and $538,945,460 to convert certain outstanding bonds; and $2,000,000,000 each of certificates of indebtedness and war saving certificates, to run not more than one year and five years, respectively, at rates to be fixed by the secretary of the treasury.

Bland Wants Cars

Washington, Sept. 11.—Representative Oscar E. Bland of Indiana, last week presented a bill in the house authorizing the President to have the interstate commerce commission or any one he may name to expend $100,000,000 in the construction of 65,000 to 100,000 freight cars for the transportation by railroads of coal and other products and commodities. The bill is designed chiefly to relieve the coal situation as Congressman Bland is from an Indiana coal district. He is the author of the Indiana two-cent fare law.

Will Conduct Experiments on Manganese Ore

Washington, Sept. 11.—The new mining experiment station which the bureau of mines has established at Minneapolis will handle all of the bureau's experiments on manganese ores. This branch will be known as the Lake Superior station. Since the treatment of low grade manganese ores is an important question in the region the effectiveness of the experiments it is hoped will be increased by their being conducted in this new station. In addition, the Lake Superior station will conduct experiments on copper ores, although the copper station proper is located at Tucson, Ariz. The Lake Superior copper experiments will be those peculiar to the ore in that region. The superintendent for the new station will be named after civil service examination.

The Lake Superior station is the first of the second three of 10 authorized by congress two years ago. The

first three now are in operation at Tucson, Butte, Mont., and at Fairbanks, Alaska.

War Convention

Of Chamber of Commerce of United States at Atlantic City

A war convention of American business will be held under the auspices of the Chamber of Commerce of the United States of America on the Garden Pier, Atlantic City, Sept. 18 to 21. This emergency meeting has been called to consider the special problem affecting the business of the United States developed by the war and readjustments in industry and trade that must be made without delay will be discussed.

The executive committee of the Chamber of Commerce of the United States has been meeting continually in Washington for nearly four months and has been brought in close contact with many new problems affecting the business of the country occasioned by the war. In announcing the object of the convention, R. Y. Rhett, president of the chamber, states that business men never have faced such rapidly changing and uncertain conditions. Therefore he concludes that thoughtful discussion of them and renewed ambition for accomplishment should add new inspiration to business and to all of our people in this war for civilization and humanity.

The four following subjects outline the program but each of these subjects has many subdivisions: "The duty that business owes the government in war. How may the business of the country render greater service in winning the war? Ways and means by which business may most readily adjust itself to the conditions produced by the war. For what adjustments after the war must business prepare? Members of the President's cabinet will appear before the convention at some of the sessions during the week.

Fluorspar Production in 1916 Was Heavy

American mines broke another record last year in the production of fluorspar, as shown by statistics compiled under the direction of Ernest F. Burchard of the United States geological survey. In 1916 the shipments were 155,735 short tons, valued at $922,654, an increase of 14 per cent in quantity and of 21 per cent in value over the shipments of 1915, heretofore the record year.

The increased demand for fluorspar has come largely from the manufacturers of open-hearth steel, who use the mineral as a flux, but the demand for it in other metallurgic operations and for the manufacture of hydrofluoric acid has been very active.

The bulk of the fluorspar sold in 1916, as in former years, was gravel spar, the quantity in 1916 amounting to 133,651 short tons, or nearly 86 per cent of the total. The average prices per ton received at the mines in 1916 were, gravel $5.34, lump $7.94 and ground $12.38, and the general average price for all spar sold was $5.92. These prices compare with $4.89, $7.51, $10.80, and $5.58, respectively, in 1915. The imports of fluorspar in 1916 were 12,323 short tons, valued at $54,000, compared with 7167 short tons, valued at $22,878, in 1915.

Submarine Boat

Reaches Understanding With Government About Huge New Plant

Although contracts have not yet actually been signed, an understanding as to the contract has been arrived at in connection with the government shipbuilding plant to be erected at Port Newark terminal, Newark, N. J., by the Submarine Boat Corp., New York. Agreements as to the vessels to be built, it is expected, will be signed shortly by the Emergency Fleet Corp. The first contract will call for 50 standardized vessels, each 5000 tons in capacity, with a speed of 10½ knots. They will be built of tank plates and structural shapes, about 1600 tons per vessel, which will be fabricated by more than 100 bridge and tank shops throughout the country. The Submarine Boat Corp. plant is being located on a 112-acre site and it will have 28 ways. These will be built of timber and are to be equipped with derricks instead of the usual shipbuilding cranes. Practically the only steel to be used in the construction of the plant itself will be for the buildings.

The American International Corp. states that while an agreement has been reached with the Emergency Fleet Corp. as to the construction of a government shipbuilding plant at Hog island, Philadelphia, no contracts yet have been signed for the construction of the yard itself or for the vessels to be built.

As previously announced in THE IRON TRADE REVIEW, the Merchant Shipbuilding Co. recently obtained a contract from the Emergency Fleet Corp. whereby it will build 40 9000-ton freighters at the new plant which it is constructing at Bristol, Pa.

The Acar Mfg. Co., 30 Church street, New York, has opened an office at 649 McCormick building, Chicago, in charge of Leland T. Johnson.

Electrical Men Meet

Engineers of Iron and Steel Trade in Annual Session

Philadelphia, Sept. 12. (By wire.)—The Association of Iron and Steel Electrical Engineers opened its eleventh annual convention here Monday at the Bellevue-Stratford. After a business meeting in the morning, the first professional session was held in the afternoon. The convention will continue with two sessions a day until Friday afternoon. The annual banquet will be held tonight.

On the program today was a patriotic meeting at which talks were given by prominent army and navy engineers. E. H. Martindale read a paper on carbon brushes, and Richard H. Rice on turbo-generators. Joseph G. Worker read a paper on "Fuel Economy by Co-operation in Establishing a Better Practice in the Operation of Stokers and Boilers". Two of yesterday's papers are given elsewhere in this issue: "Electrical Reversing Blooming Mills", Ralph D. Nye, and "Factors Relating to the Economical Generation and Use of Electrical Power in the Steel Industry", Brent Wiley. Joseph McKinley and Ray L. Baker read papers on "Central Station Power Supply to Iron and Steel Industry". On Monday papers were read by Walter Greenwood on "Safeguarding Electrical Equipment", and Walter C. Kennedy on "Heroult Electrical Furnaces". The convention will close Friday afternoon with visits to Cramp's shipyard, the Midvale steel plant and the Baldwin locomotive works.

Will Move Into New Quarters

Herman L. Winterer, dealer in second-hand rebuilt machinery, now at 908-910 Beach street, Philadelphia, will remove to a new building at 943-953 north Front street, Philadelphia, Sept. 1. The building is a 3-story brick, steel and concrete structure, 114 x 220 feet daylight construction. The building is equipped with cranes and the plant is served by a railroad siding near the shipping room and the workshop. Twenty-five men now are employed.

C. F. Drozeski, president and general manager of the Saginaw Malleable Iron Co., Saginaw, Mich., states that the company's new buildings will be ready for occupancy within the next 30 days.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Why Have Stocks Declined?

PRICE-FIXING and taxation proposals have been ascribed as the reasons for the sharp declines in steel and other industrial stocks. But these influences have comparatively little relation to the railroad shares, which have suffered most keenly in the recent severe liquidation. Led by New York Central, the railroad list has declined to the lowest average since early in 1915. Even Pennsylvania railroad, considered as strong as the government, dropped to the lowest level it has reached since 1895.

Several theories have been advanced for the selling of railroad stocks. One is that American securities pledged as collateral for British loans are being sold; however, this view is not widely accepted as it is contended that liquidation of foreign-held American collaterals would not be attempted without previously trying to syndicate them among banking houses. Another theory is that the present is a "peace market", this view being held by several in the financial community who think that Germany's financial condition will not permit her to carry on the war much longer. Others believe that the selling has been due to a desire among investors to be in a position to take up the next government loan; but this view received little serious consideration. The most plausible theory is that the liquidation results from selling by the speculative, not the investment public. A month or so ago, many brokers were advising the public to buy railroad shares on margin, advancing the prospects of "inflation" and an autumn bull market as reasons. But the stock market inflation failed to materialize and, instead, the money market has gone against the speculators.

Why Industrials Go Down

But the market observer need not go far to seek a reason for declines in the industrial list. On July 11, last, the President stated his now famous "one price to all" policy and made it clear to Wall Street that if the administration could help it, no one would get rich from this war. Since that day the stock market, despite the midsummer dullness and the various monetary fluctuations of various stocks, has been steadily going down hill. The following table shows the quotations of seven representative industrial and seven rail shares on July 11, and at their lowest point last week, with the net loss:

INDUSTRIALS

	July	Last wk.	Loss
Am. Loc.	72	57½	14½
Bald. Loc.	71¾	55	16¾
Beth. B	134⅜	100	34⅜
Cen. Leather	90⅝	78½	12⅛
Mex. Petroleum	98	86	12
Republic Stl.	92⅝	77	15⅝
U. S. Steel	127½	104½	23

Average loss, 18⅛.

RAILROADS

Atchison	100⅛	95	5⅛
St. Paul	71⅝	62½	9⅛
Del. & Hudson	113	99⅛	13⅜
N. Y. Central	90	74¾	15¼
New Haven	36¾	24⅝	12½
Reading	96¼	80¼	16
Union Pacific	135⅛	127	8⅛

Average loss, 11⅜.

War Stocks Increase

The new capital stock authorized in August for companies organized to manufacture war materials was $36,400,000, according to the *Journal of Commerce*. This is the largest total for any one month since the beginning of 1915. The total so far this year is $69,798,000 and for the past 32 months $203,225,000. Since the entrance of the United States into the conflict the new capital has been growing more rapidly, after a period of several months in which it decreased. Airplane companies are the largest single factor so far this year, though in August the munitions companies made great increases.

Butte Reduces Dividend

The Butte & Superior Mining Co. reduced its quarterly dividend to $1.25 a share against a previous payment of $2.50. Dullness of the spelter market and the strike are blamed. The directors' statement said that they regarded the new rate as a safe and normal rate for the company to undertake permanently to disburse to its stockholders. The porphyries, on the other hand, maintained their rates. For the last quarter of the year, however, their officials admit the rate may have to be reduced on account of the excess profits tax and various elements that may enter the market.

Unfilled Orders Drop

The unfilled orders of the United States Steel Corp. fell off 433,115 tons during the month of August, as compared with July, to a total of 10,407,049 tons. The following table shows how the amount of unfilled orders stood at the end of each month, and as compared with the previous month, for the past year and a half:

Date.	Total.	Change, tonnage.	Change, per cent.
Aug. 31, 1917..	10,407,049	433,115—	4.16—
July 31, 1917..	10,844,164	539,123—	4.74—
June 30, 1917..	11,383,287	503,304—	4.24—
May 31, 1917..	11,886,591	296,492—	2.43—
Apr. 30, 1917..	12,183,083	471,439+	4.02+
Mar. 31, 1917..	11,711,644	134,947+	1.16+
Feb. 28, 1917..	11,576,697	102,643+	0.90+
Jan. 31, 1917..	11,474,054	73,232—	0.64—
Dec. 31, 1916..	11,547,286	488,744+	4.43+
Nov. 30, 1916..	11,058,542	1,043,282+	10.41+
Oct. 31, 1916..	10,015,260	492,676+	5.18+
Sep. 30, 1916..	9,522,584	137,133—	1.42—
Aug. 31, 1916..	9,660,357	66,765+	.69+
July 31, 1916..	9,593,592	46,866—	0.48—
June 30, 1916..	9,640,458	297,340—	3.09—
May 31, 1916..	9,937,798	108,247+	1.11+
Apr. 30, 1916..	9,829,551	498,550+	5.34+

Financial Crop Ends

Sales of stocks on the New York exchange in August were 1,148,000 shares less than in July and 2,862,000 less than a year earlier.

* * *

Nova Scotia Steel & Coal Co., Ltd., earned $1,596,469, after interest, in the six months ending June 30, against $2,104,478 for 1916.

* * *

The Westinghouse Electric & Mfg. Co. will pay off on Oct. 1, out of cash in the treasury, the $2,720,000 5 per cent notes maturing on that day. Net profits of the first four months of the present fiscal year are estimated to be $1,000,000 more than for the similar period a year ago.

* * *

The American Steel Foundries Co. has gone to a 7 per cent basis with the declaration of a quarterly dividend of 1¾ per cent. The former rate was 5 per cent a year. In July the company retired $1,200,000 short term notes and in August it called for payment on Oct. 1 of $1,300,000 of its 6 per cent bonds. The amount saved on bond interest will be several thousand dollars more than the increase in dividends.

Manufacturers Offer Labor Solution

Special Committee of National Industrial Conference Board Would Prevent Change of Standards by Strike or Lockout and Would Have Disputes Settled for Duration of War by Federal Board

DESPITE numerous timely warnings from manufacturers, from government officials, and even from labor organizations, the people of the United States find that this country in the fifth month of the war, with unprecedented demands for war production, is faced with serious interruption of its industries by strikes and threats of strikes in every part of the country. Some of these industries are directly essential to army equipment or to government shipbuilding.

To prevent this menacing condition from becoming a calamity, and still endorsing "every necessary regulation for safety and health and the fair adjustment of wages in accordance with the American standard of living and the increasing cost of its maintenance", the advisory committee of the national industrial conference board recommended to the council of national defense last week that present abnormal conditions should not be used by employers or employes to alter wages, open or closed shop agreements or other relations over which there might be contention, and that a federal board should be created to adjust disputes for the duration of the war.

It was especially pointed out in the advisory committee's communication that strikes and lockouts must be avoided to win this war, no matter what the cause of the dispute might be.

The advisory committee of the national industrial conference board consists of the following five men, appointed by the board several months ago at the suggestion of Howard Coffin: L. A. Osborne, chairman, vice president, Westinghouse Electric & Mfg. Co., Pittsburgh; W. H. Barr, president, Lumen Bearing Co., Buffalo; W. H. Van Dervoort, president, Root & Van Dervoort Engine Co., East Moline, Ill.; C. A. Crocker, president, Crocker - McElwain Co., Holyoke, Mass.; E. A. Smythe, president Pelzer Mfg. Co., Greenville, S. C.

It has been the special work of this committee, which represents 16 national associations with over 18,000 manufacturers of all kinds as members, to make recommendations regarding the relations of employer and employe and the adjustment of difficulties during the war. Among the organizations represented were the National Association of Manufacturers, National Council for Industrial Defense, National Erectors association, National Founders association and National Metal Trades association.

Keep the Wheels Moving

The council of national defense also has created a committee on labor, controlled by the largest national unions. This committee has issued a declaration of policies of industrial relationships. From this declaration the advisory committee has picked up the following significant sentence:

"Neither employers nor employes shall endeavor to take advantage of the country's necessities to change existing standards."

Further amplification, endorsed by the council of national defense, was that standards of safety and service established by state or federal law should remain in effect unless and until, under the exigencies of war, the council of national defense, after proper investigation, should recommend some modification as essential to the national safety. It was likewise urged that inasmuch as the standard of living was particularly dependent upon the purchasing power of wages no arbitrary wage change should be sought through the medium of strikes or lockouts by employer or employe without affording the established state or federal mediums of arbitration or conciliation an opportunity to adjust disputes without stopping production.

After pointing out various conditions existing in the matter of wages and hours, and the statement that "so far as we know, the American manufacturer can and will pay any advance in wages which expresses corresponding labor efficiency", the advisory committee points out that there are other standards, and one of these is the principle of "closed shop". Strikes are said to be threatened, occurring and increasing in number to compel the exclusive employment of union men.

No Strikes for Recognition

These strikes, the committee emphatically urges, are contrary to any fair interpretation of the declaration that "neither employers nor employes shall endeavor to take advantage of the country's necessities to change existing standards". Mr. Thomas, the English labor representative, is quoted on account of his British experience:

"Let the employer say: 'I am not desirous of taking advantage of the war to break down something that I never believed in.' On the other hand, let the employes say: 'Whilst anxious to maintain the law, we are not anxious to take advantage of the war to enforce something during the war that we could not obtain in peace times.' With both sides recognizing that, I repeat, I believe they will find a solution."

Secretary of labor Wilson is said to have given similar expression, applying the principle to both employer and employe. According to the British policy, "Neither restriction nor discrimination, nor in 'controlled shops', strikes or lockouts are permitted. The ministry of munitions is successfully promoting the expeditious output of munitions by employing all available labor to that end."

"In this crisis America needs the service of every citizen," the communication of the committee points out. "We can no more depend upon one class to operate our factories than to fill the ranks of our armies."

The committee epitomizes its conclusions and recommendation with the following declarations:

1.—That as a basis of mutual understanding employer and employe recognize and agree that now and for the period of the war continuous, efficient production can alone equip and sustain our military forces. Every dispute, whatever its motive, which interrupts production, furthers the end and operates to the advantage of the public enemy.

2.—Industrial workers are as indispensable to victory as the soldier on the firing line. The non-union man is as necessary in the factory as he is in the army. On economic as well as indisputable moral grounds the government can therefore neither permit or tolerate exclusion of any laborer from productive employment. We, therefore, urge the council to adopt and reassert as its guiding principle the fundamental American doctrine authoritatively stated by the Anthracite Coal Strike commission with the approval of representatives of both employers and unions included in its membership and commended as the basis of industrial adjustments by Presidents Roosevelt, Taft and Wilson.

"That no person shall be refused employment or in any way discrim-

inated against on account of membership or nonmembership in any labor organization; that there shall be no discrimination against, or interference with, any employe who is not a member of any labor organization by members of such organization.

3.—The council's reiterated recommendation that "employers and employes in private industries should not attempt to take advantage of the existing abnormal conditions to change the standards which they were unable to change under normal conditions", should now receive an unambiguous interpretation to assure its practical application as a working principle. To this end we propose:

(*a*) That applied to existing statutory regulations intended to promote safety and health, it shall be agreed that for the period of the war there shall be no suspension or modification of such provisions, except upon recommendation of the council of national defense after due investigation by its agencies and when in its judgment required by the exigencies of war.

(*b*) Applied to wages, demands shall be tested by the prevailing local standard of the establishment in effect at the beginning of the war with such modification as may be shown to be necessary to meet any demonstrated advance in the cost of living.

(*c*) Applied to hours, the standard shall be those established by statute or prevailing in the establishment at the beginning of the war subject to change only when in the opinion of the council of defense it is necessary to meet the requirements of the government.

(*d*) Applied to what are commonly known as "open" or "closed" shop conditions, it shall be understood and agreed that every employer entering the period of war with a union shop shall not by a lockout or other means undertake to alter such conditions for the duration of the war, nor shall any combination of workmen undertake during the like period to "close" an "open" shop.

4.—Adopting these standards as the basis of its operation we recommend the creation of a federal board to adjust labor disputes for the duration of the war. The activities of this board to be confined to disputes growing out of employment on the subject matter of war production for the government. To such board shall be primarily referred for final settlement all major disputes of the nature suggested with full power to create all machinery necessary to execute its functions. Its decisions must bind all parties to the dispute. It should be constituted equally of representatives of employes, employers and the government, the representatives of the latter to hold the deciding voice in the event of an equal division of opinion. It is to be further understood and agreed that there shall be no interruption of production by strike, lockout or other means within the contract of employer or employe.

5.—We pledge to the country through you the acceptance of such a program by the great body of representative associations and individual manufacturers we are authorized to represent. We do not seek to be regarded as the exclusive spokesman of all industry and will co-operate with any manufacturer.

6.—To secure in the public interest a mutual understanding and agreement predicated upon the proposals set forth, we suggest: That the council of national defense call, at the earliest convenient date a conference of representative national and international officers of American trade unions that they may be requested to join in the pledge here made on behalf of employers.

Safety Meeting Opens

National Council Holding Sixth Annual Convention

New York, Sept. 12. (By wire.)—The sixth annual congress of the National Safety council was opened here Monday and will run through the week. In addition to the general sessions for the discussion of safety, there will be a number of group meetings devoted to the various trades. An exhibition of safety devices also is a feature of the convention.

The first session of the iron and steel section was held this afternoon. The meeting was opened by George T. Fonda, chairman of the section, and safety engineer of the Bethlehem Steel Co., with a report of the year's work in this division of the National Safety council. L. H. Burnett, assistant to the president of the Carnegie Steel Co., addressed the assembly on "Unsettled Accident Prevention Problems in Iron and Steel Industries". Dr. Lucian W. Chaney, of the United States department of labor, made an address entitled "Analyses of Accidents". D. R. Kennedy, assistant to the president of the Youngstown Sheet & Tube Co., and L. W. Hatch, chief statistician, department of labor in New York state, discussed the topics taken up by Dr. Chaney. Reports of officers and committees were given. Another iron and steel session will be held Thursday afternoon.

Tin Exports Grow

American Tin Plate Now Exported to Seventy-Five Countries

Exports of tin plates, terne plates and taggers' tin reached their highest record in the fiscal year ended June 30, 1917, with a total of 521,861,390 pounds valued at $28,404,433, against 516,257,473 pounds valued at $18,703,773 in 1916, and 105,899,762 pounds valued at $3,643,806 in 1914, according to figures compiled by the bureau of foreign and domestic commerce, department of commerce. While the increase in 1917 over 1916 was only 5,603,917 pounds, the increase in value was $9,700,660.

The large exports in the past two years are remarkable when the fact is taken into consideration that tin plate has become a factor in our export trade only during the last decade. The first record of exports of tin plate was in the year 1898, when 20,827 pounds were exported.

American tinned plate is exported to 75 countries in all parts of the world. Canada, our best customer, took 133,650,000 pounds in 1917, Argentina 51,300,000 pounds, Japan 46,500,000 pounds, British India 39,800,000 pounds, Dutch East Indies and Brazil 31,200,000 pounds each, China 30,500,000 pounds, Hongkong 22,500,000 pounds, United Kingdom 19,500,000 pounds, Italy 18,600,000 pounds, Straits Settlement 12,750,000 pounds, Uruguay 11,500,000 pounds, France 10,600,000 pounds, Cuba 9,000,000 pounds, Mexico 4,350,000 pounds, and Russia 4,200,000 pounds, with lesser amounts to many other countries. In addition to these large exports to foreign countries, there were shipments to Alaska aggregating 38,828,357 pounds, and to Hawaii 17,949,296 pounds. There were also shipped to Alaska tin manufactures, chiefly tin can bodies and tops, valued at $3,894,165.

The following table shows the imports and exports of tin plates, terne plates and taggers' tin for a series of years. It is a remarkable fact that the imports of this commodity reached the highest record in the year in which domestic manufacture commenced:

Years	Imports, pounds	Exports, pounds
1891	1,036,489,074	.....
1892	422,176,202	.....
1899	108,484,826	205,910
1901	117,880,312	1,367,405
1904	126,909,360	8 107,666
1906	120,819,732	25,967,137
1911	95,319,730	70,199,398
1912	6,613,253	181,899,366
1914	48,877,947	105,899,762
1916	1,796 853	516,257,473
1917	1,370,462	521,861,390

The production of domestic tin plate commenced in 1891, during the last six months of which there were produced 2,236,743 pounds. In 1892, the first full calendar year of the industry, the production reached 42,119,192 pounds and in 1916 it was 2,776,401,000 pounds. Of the production in 1916, 2,552,224,000 pounds were tin plates and 214,177,000 pounds terne plates.

The Pacific Hardware & Steel Co., San Francisco, has reopened its eastern office at 30 Church street, New York. It is in charge of E. R. Wendemuth, who was formerly connected with the New York office of the Pacific Hardware & Steel Co. For the past two years, however, Mr. Wendemuth has been manager of the Pittsburgh office of Oliver Bros., Inc., New York.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

EDWARD M. HAGAR has been elected president of the American International Steel Corp., which recently has been organized as a subsidiary of the American International Corp. Mr. Hagar is well known in the iron and steel industry, having been president of the Universal Portland Cement Co., a subsidiary of the United States Steel Corp., for 15 years. He graduated from Massachusetts Institute of Technology in 1893, and from Cornell university in 1894, and after graduation, organized and conducted the business of Edward M. Hagar & Co., manufacturers' representatives in machinery lines, in Chicago. When the Universal Portland Cement Co. was organized, in 1900, Mr. Hagar was elected to the presidency, and continued in this capacity until his resignation, in February, 1915. For two years he was president of the Association of American Portland Cement Manufacturers, and he also was organizer of the Cement Products Exhibition Co., which held its first annual industrial exhibition in 1907.

The American International Steel Corp. will engage in the exportation of iron and steel products and plans to develop a foreign selling organization. Offices already have been established in London and Buenos Aires, and others will be opened in the principal cities of the world. The company's general offices are located at 120 Broadway, New York.

F. H. Willcox, who recently resigned from the Huessener Engineering Co., Pittsburgh, has become connected with Freyn & Co., engineers and contractors, 643 Peoples Gas building, Chicago.

Ralph T. Haws, who for many years has been connected with the Climax Fire Brick Co., Clarion county, Pa., has been named general manager, secretary and treasurer of the company succeeding Charles H. Luke, who resigned a short time ago.

Charles E. Hathaway, assistant treasurer of the Fore River Shipbuilding Corp., Quincy, Mass., has resigned owing to ill health after 16 years' service. He is succeeded by John F. Hanly, head bookkeeper. H. Edgeworth Frick, assistant superintendent in charge of the hull department for the same corporation, has also resigned after 13 years' service, to accept a position on the inspection staff of the United States shipping board. Mr. Frick has been assigned to duty in Delaware.

James Lloyd, for some time assistant superintendent in the South Side

EDWARD M. HAGAR

plant of the Jones & Laughlin Steel Co., Pittsburgh, has been made general superintendent of the operating department of the Sharon Steel Hoop Co., Sharon, Pa.

John A. McGregor, president of the Union Twist Drill Co., Athol, Mass., and Frank E. Wing, treasurer of the L. S. Starrett Co., also of Athol, have initiated a home-building movement among Athol manufacturers to provide homes for workmen.

George D. Kirkham, who has been in charge of the St. Paul office of the American Steel & Wire Co., has returned to the company's Chicago office. H. S. Durant has returned from Washington, D. C., to take up his duties at the St. Paul office.

David E. Carpenter, Grass Lake, Mich., service engineer with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for the past six years, has resigned to enter the government service. After visiting friends in New England he will return to Pittsburgh to await orders.

G. W. Wildin, general mechanical superintendent of the New York, New Haven & Hartford railroad, has been appointed general manager to succeed C. L. Bardo, promoted as assistant to the president. G. O. Hammond takes Mr. Wildin's place with W. L. Bean as assistant.

George W. Wagstaff has been appointed sales manager of the Onondaga Steel Co., Inc., and will be located at the general offices of the company at Syracuse, N. Y. Mr. Wagstaff formerly had charge of the Detroit, Toledo and Cleveland territory for the Onondaga company.

E. F. Carry, president of the Haskell & Barker Car Co., Michigan City, Ind., has been made a member of a labor adjustment board to adjust labor disputes on ships being built for the government under the supervision of the Emergency Fleet Corp., United States Shipping Board.

J. K. Mac Neillie, general superintendent of the Canadian government railways, has resigned to accept a position on the Delaware & Hudson railroad under F. P. Gutelius, former manager of the Canadian government lines. He is succeeded by L. S. Brown, late assistant general superintendent.

Lewis M. Ream, an assistant superintendent at the south works of the American Steel & Wire Co., Worcester, Mass., a son of the late Norman P. Ream, who was a director of the United States Steel Corp., has enlisted in the aviation corps as an instructor. He is awaiting orders to report for duty.

George W. Bunnell, president of the Power Construction Co., Worcester, Mass., engineer and contractor, who recently was commissioned colonel of the First Massachusetts regiment of engineers, has been made a chief of engineers, on the staff of Maj. Gen. Clarence R. Edwards, commanding the Twenty-sixth brigade, U. S. A., which soon is to sail for France.

Large Lists Almost Bewilder Market

New York Machine Tool Dealers Receive Inquiries for 360 Machine Tools for American Munitions Depot in France—Bulk of Remaining Inquiries Come from Airplane and Domestic Munitions Makers

EVERY week sees increased pressure in the market for heavy machine tools. Builders not only are not making headway with deliveries against contracts but are steadily falling behind. The heavy machinery department of one builder made shipments in August valued at about $200,000. But it added business to its books valued at over $1,000,000. Some leading builders which recently reported they were booked to capacity for fully a year ahead on equipment directly or indirectly needed for government work, now state they are booked a year and a half ahead in some lines, two years in others and still further ahead in other lines. From the selling standpoint some of these builders no longer are a factor in the machinery market. Their plants are at the disposal of the government, which decides what user shall receive preferred delivery. The government's ordnance, cargo-ship and destroyer programs, together with large expansion of engine building facilities, literally have swamped the heavy machinery market. Small machines, including single purpose lathes, have not yet felt greatly the stimulus of war work, but prices continue to advance with increased costs.

New York Dealers Swamped With Inquiries

The Stone & Webster Engineering Corp., 147 Milk street, Boston, which has been co-operating with the government in several undertakings, including work on cantonments, an extension to the Rock Island arsenal, and coast fortification work, has issued a list of about 360 machine tools for an American ordnance base depot in France, on which bids will close Sept. 19. The list includes complete equipment for a machine shop, smith shop and tool room, and in addition the following machines: Twenty-four engine lathes, of which nine are 24-inch, eight 36-inch, four 42-inch and three 48-inch; 214 boring mills, of which 56 are 24-inch, twenty-five 36-inch, thirty-three 42-inch, fifty-seven 38-inch, and twenty-eight 48-inch; thirty-five 18-inch grinders; and about sixteen 2½ or 3-inch horizontal drills. The Tacony Ordnance Corp., 50 Church street, New York, has issued a list of heavy tools needed for its new ordnance plant at Philadelphia, including 56 large gun boring lathes, a number of 100-inch planers, 72 to 84-inch boring mills, 30-inch slotters, etc. The American & British Mfg. Co., Bridgeport, Conn., is about to close on ten 24-inch lathes. The North East Electric Co., Rochester, N. Y., has issued a small list of tools, as follows: Two radial drills, two shapers, two small lathes, one universal milling machine and one universal grinder. The Vulcan Steel Products Co., 120 Broadway, New York City, is figuring on equipment. The General Vehicle Co., Long Island City, N. Y., which recently issued a list of about $1,000,000 worth of tools for an airplane engine plant is figuring actively and is expected to close for much of this equipment shortly. The Simplex Automobile Corp., New Brunswick, N. J., which recently issued a list of about 100 machines, has not yet closed. The Trego Motors Corp., New Haven, Conn., is reported to have issued a list of machine tools.

Shipbuilders and ordnance makers continue active in the crane market. The Tacony Ordnance Corp. is inquiring for 21 electric traveling cranes, including one 60-ton ladle crane, two 40-ton hydraulic electric, one 30-ton, two 20-ton, two 10-ton and the remainder 5-ton cranes. The Stone & Webster Engineering Corp., Boston, has issued a list of eight electric traveling cranes, including four 10-ton, one 20-ton, two 40-ton and one 30-ton cranes, understood to be for the Watertown arsenal. The Fore River Shipbuilding Co. is figuring on a number of small cranes. The Merchant Shipbuilding Corp., Philadelphia, which recently bought 24 shipbuilding cranes, has not closed for all its crane requirements. The Union Pacific railroad has closed for five locomotive cranes with the McMyler-Interstate Co., Cleveland. The rumor persists that the Pennsylvania railroad, acting in conjunction with S. M. Felton, director general of railroads at Washington, is figuring on 70 to 80 locomotive cranes for France. The list of eight electric traveling cranes recently issued by William Cramp & Son's Ship & Engine Building Co., Philadelphia, remains pending. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is inquiring for a 250-ton derrick.

Chicago Market Feels War's Stimulus

THE demand for machinery for war purposes is becoming more and more a feature of the Chicago market. The arsenal at Rock Island has been buying considerable equipment of a general nature, taking tools on which inquiries were issued several weeks ago. This business has been spread fairly well among various dealers in order to get best delivery possible. Considerable diversion of tools is now going on. In some cases shipments all ready for forwarding to neutral countries have been shipped to domestic users who have government contracts. In another instance machines completed and ready for shipment to domestic users have been commandeered by the government for shipment to France to equip machine shops in connection with the railroads being built there by this government. The Edward Valve & Mfg. Co., which recently increased its capital stock from $1,000,000 to $1,500,000, has taken on considerable work for the government, and is buying additional equipment. The Rock Island railroad recently inquired for a few tools to be used in its shop at Shawnee, Okla. The American Car & Foundry Co. has bought several lathes, radial drills and some sheet metal working machinery for its plant at Jeffersonville, Ind. The Western Rope & Cordage Co. of Tulsa, Okla., has changed its name to the Western Rope & Mfg. Co., and is removing to Milwaukee where it has bought a plant. It has bought some equipment and will begin the manufacture of gasoline engines in addition to its regular line. The Charles Stecher Co. of Chicago, manufacturer of a vertical boring machine for boring spindles, has

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From the very day on which we began to turn out steel, we have had a constant struggle to keep pace with the demand for our product, although we have several times enlarged our plant and are at present making further additions.

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adapted it to the boring of recoil cylinders for ordnance. An inquiry was current recently on the part of the government seeking to place about $1,500,000 worth of gun mounts, but it is not known whether this was successful. A recent appropriation gives the Rock Island arsenal $1,400,000 additional funds which may cause further buying of machine equipment. Railroads are showing some activity in enlarging their facilities. The Indiana Harbor Belt railroad is preparing to build a power house at Franklin Park. The Burlington railroad will build a machine shop at Cicero, and the Grand Trunk railroad a large freight car repair shop at Port Huron. The Eastern Wisconsin Electric Co. is building a power house at Sheboygan, Wis. Morris & Co. is building an addition to its tin can factory at the Union stock yards, Chicago. The Barnes Foundry & Mfg. Co., Ecorse, Mich., is planning to build a foundry for the manufacture of automobile cylinders. The Duluth Iron Works Co and the McDougall-Duluth Shipbuilding Co. will build and equip machine shops, forging shops and blacksmith shops. The city of Poteau, Okla., is preparing to build a waterworks pumping station; Lawton, Okla., will make extensive waterworks improvements; Hamilton, Mo., will build a waterworks plant, including a centrifugal pump, and the Santa Fe railroad will build a waterworks plant at Chanute, Kans., to provide a supply for its locomotives.

Pittsburgh Business is Lethargic

THE market for machinery and machine tools in the Pittsburgh district continues to be at a virtual standstill. No inquiries of consequence from private buyers are pending and none seems to be in immediate prospect. Manufacturers are booked far ahead with both government and private business and some of them are out of the market for further orders. Private buyers are expected to come into the market, however, after the government's program has been taken care of and prices are lowered. For the present, they are hesitating about putting out inquiries, except in case of pressing necessity, because of the high prices of deferred deliveries. The Koehler & Streng Co., iron and steel scrap dealer, Carnegie, Pa., is inquiring for one 10-ton and one 5-ton overhead electric traveling crane with motors complete. The span in both instances is to be 30 feet. Additional machine tools for gun forging work in connection with the government contracts are being inquired for by the Erie Forge Co., Erie, Pa. The Cleveland Crane & Engineering Co., Wickliffe, O., has taken a contract for 18 cranes to be delivered in 90 days for the Pennsylvania railroad for use in the government locomotive shop to be constructed in France. The first lot of cranes will be shipped 25 days after the order has been received.

Airplane Makers Figure in Cleveland Market

AIRPLANE makers have figured prominently in the Cleveland machine tool market during the past week. Brought on by the government's plan for quick, concerted action in the production of airplanes, a number of inquiries of substantial size have been heard in the Cleveland district. Two large lists have been issued by these makers during the past week, but owing to the secrecy attending government work of this nature, no particulars are available. Inquiries from munitions makers also have given considerable stimulus to the market; one dealer reporting that current inquiries from this source aggregate about 50 boring mills. The bulk of the remaining inquiries are from scattered sources and for small tools. A new corporation, the Engel Aircraft Co., soon will exercise an option on the plant of the Niles Car & Mfg. Co., Niles, O., it is reported. The Poe Engineering Co. has made application for a permit for a two-story, 51 x 105-foot machine shop for the J. C. Ulmer Co. An interesting feature of the market is an inquiry received by one local dealer from the Marble-Card Electric Co., Gladstone, Mich., for second-hand boring mills, lathes, punch presses and other tools. The same dealer also has received an inquiry from the South Bend Lathe Works, South Bend, Ind., for one or two Brown & Sharpe, type 23 or 24, friction-drive milling machines. The American Blower Co., Detroit, is in the market for a horizontal boring machine and a 6-foot full universal radial drill. An inquiry has been issued by the Defiance Machine Co., Defiance, O., for two 18-inch slotters. The John Goodison Thresher Co., Sarnia, Ont., requests prices on a 1½-inch bolt cutter.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

AUGUSTA, ME.—The Leonard Valveless Engine Co. has been incorporated with $25,000 capital by L. J. Coleman, C. L. Andrews and M. F. Hearin.

OAKFIELD, ME.—The Bangor & Aroostock railroad, Graham building, Bangor, will build a machine shop, pump house and engine house.

CLAREMONT, N. H.—The Sullivan Machinery Co. has let the contract for a reinforced concrete, 3-story, 80 x 121-foot addition, a 3-story addition to building No. 33 and a 5-story, 16 x 21-foot addition.

PORTSMOUTH, N. H.—The Rockingham County Light & Power Co. will expend about $150,000 for new equipment, plans for which are being prepared by Harry M. Hope, Boston, engineer.

BURLINGTON, VT.—Welch Bros. have let the contract for a brick, 2-story, 53 x 104-foot factory, to cost $22,000.

BOSTON.—Kings Terminal, 70 State street, has plans for a boiler house extension, to be 1-story, 30x30 feet.

BOSTON.—The Klinch Mfg. Co. has been incorporated to make metal goods with $40,000 capital by Frank S. Elliott, Irvin L. Lindabury and Henry W. Pelton, Lynnfield, Mass.

CAMBRIDGE, MASS.—The Puritan Linotype Co., Boston, has let the contract for a

Vacation Talks with

ROLLING MILL JIM

Well, fellows, just got back from some fishing trip, and I sure had plenty of luck. I don't want to discourage any you boys that haven't had your fishing vacations yet so won't tell you this time what big catches I made, but believe me boys they were sure sound, and made me think of Hubbard rolls.

So long—

Rolling Mill Jim.—

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

Say you saw it in THE IRON TRADE REVIEW

concrete block, 1-story, 57 x 175 foot building at 65 Austin street.

FRAMINGHAM, MASS.—The Framingham Shoe Co. has let the contract for a reinforced concrete, 3-story, 75 x 200-foot factory and storehouse, off Fountain street.

NEW BEDFORD, MASS.—Hill Cutter Co. will build a boiler and engine shop to cost $9,000.

NORTH ADAMS, MASS.—The Blackinton Mill has let the contract for a brick, 3-story mill building to cost $40,000.

NEW BEDFORD, MASS. — The B. F. Smith Co., Pawtucket, R. I., has been awarded the contract for a brick, mill construction, 4-story, 59 x 321-foot addition to the mill of the National Spun Silk Co., on Purchase street, to cost $200,000.

SOMERVILLE, MASS. — The American Tube Works has let the contract for a brick and steel, 1-story, 23 x 45-foot building on Somerville avenue.

WORCESTER, MASS.—The Heald Machine Co. has let the contract for a brick and reinforced concrete, 1-story, 80 x 190-foot addition and a 1-story, 32 x 80-foot addition to its plant on New Bond street, to cost $47,000.

WORCESTER, MASS. — The Worcester Machine Screw Co., branch of the Standard Screw Co., has let the contract for a brick, mill construction, 3-story, 51 x 115-foot addition to its machine shop, a 1-story, 60 x 75-foot addition and a 1-story, 42 x 45-foot storage building on Beacon street, to cost $50,000.

PROVIDENCE, R. I.—The Fuller Iron Works will build a brick, mill construction, 1-story, 20 x 50-foot addition for an annealing room at West Exchange and Sabin streets.

BRIDGEPORT, CONN.—Hunter & Hayes, South avenue, will build a 1-story plant addition, 27x33 feet.

BRIDGEPORT, CONN.—The New Remington Rifle Co. has been incorporated with $100,000 capital by John T. Robinson, Francis E. Jones and George F. Jabbet, New York.

BRIDGEPORT, CONN.—The Locomobile Co. of America, has let the contract for a brick, 1-story, 32 x 315-foot addition to its plant on Main street to cost $20,000.

HARTFORD, CONN.—The M. S. Little Mfg. Co. will build a brick, mill construction, 1-story, 50 x 225-foot factory and a 20 x 70-foot office building on New Park avenue.

HARTFORD, CONN. — The Terry Steam Turbine Co. will build a brick, 1-story, 100 x 108-foot addition to its factory and a 2-story, 20 x 50-foot addition to its office building.

NEW HAVEN, CONN. — The Sperry & Barnes Co. will build a brick, 3-story, 33 x 100-foot factory addition.

NEW HAVEN, CONN.—The National Engineering Corp., 40 Central street, Boston, will build a 1-story forge shop, 50x120 feet, for the Kilborn & Bishop Co., 194 Chapel street.

NORWICH, CONN.—The Eastern Connecticut Power Co. has been incorporated with $1,500,000 capital by Robert W. Perkins, E. C. Winchester, and Charles B. Whittlesey, New London.

STAMFORD, CONN.—The New Rochelle Radiator Co. has been incorporated to make automobile accessories with $4800 capital by Harry Chait, Max Defrin, Max Machobatsky and Joseph Delrin, New York.

ATLANTIC CITY, N. J.—A contract has been awarded to M. B. Markland, for a 2-story, 16x150-foot brick and concrete warehouse.

BAYONNE, N. J.—A. T. Malmed & Co. recently organized in Philadelphia, are having a plant erected here for the manufacture of a metallic concrete hardener. The construction work is in charge of Walter Kidde & Co., 90 West street, New York.

BELLEVILLE, N. J.—The Belleville Metal & Chemical Co. has been incorporated with $50,000 capital to manufacture chemicals.

HARRISON, N. J.—The Hyatt Roller Bearing Co. has bought the iron foundry of Penton Bros., Somerset street.

JERSE YCITY, N. J.—The Wright-Martin Aircraft Corp. capitalized at $5,000,000, has been chartered to build airplanes, etc., by John F. Alvord, J. F. Alvord and T. W. Allen.

NEWARK, N. J.—The Gammon Motor Co., manufacturer of tools and fastenings, has leased a 3-story plant at Mulberry and Murray streets, for manufacturing purposes.

NEWARK, N. J.—The American Building Co. capitalized at $100,000, has been chartered to construct buildings by Archie Brantler, Sked Williams and David C. Weaver.

NEWARK, N. J.—William E. Lehman, 738 Broad street, is interested in the proposed erection of a 3-story factory building, 80x100 feet.

PLAINFIELD, N. J.—Bids are being taken on the construction of an addition to the machine tool manufacturing plant of the Niles-Bement-Pond Co.

DOVER, DEL.—The Steelcrete Railroad Tie Co. has been organized for the purpose of manufacturing concrete railroad ties. The company has a capital of $1,000,000 and was incorporated by W. C. Halleck, New York, G. A. LeFevre, Richmond, N. Y., and W. Hairser, Bloomfield, N. J.

WILMINGTON, DEL.—The Ontario Smelting Co. has been chartered with $250,000 capital by M. L. Gatchell, L. A. Irwin and Harry W. Davis.

WILMINGTON, DEL. — The Western Alkali Refining Co. has been incorporated with $2,000,000 capital to make alkali and chemicals. The incorporators are: C. R. Mudge, C. D. Hopkins and A. M. Gorman.

WILMINGTON, DEL.—The American International Steel Corp. has been incorporated with $1,000,000 capital to carry on a general mercantile and commercial business. The incorporators are: F. A. Armstrong, C. M. Egner and W. S. Randall.

ALEXANDRIA, VA.—The General Aeronautic Corp. has been organized with $100,000 capital by John J. Graham, K. W. Ogden and H. E. Green.

GOSHEN, VA. — The Southeastern Iron Corp. has been organized with a capital of $500,000 by Francis H. Hardy, Chester D. Tripp and Truman F. Miller.

NORFOLK, VA.—The American Chain Co., Bridgeport, Conn., contemplates constructing a plant here.

WASHINGTON.—The Hall Steamship Co. has been chartered in Delaware with $500,000 capital to build and operate sailing vessels. E. Madison Hall, C. N. Riker and S. W. Harrington are the incorporators.

Along the Middle Atlantic Seaboard

BROOKLYN, N. Y.—Charles Roos & Son Co., machinist, will build a 1-story plant, 50x85 feet, to cost $8,000.

BROOKLYN, N. Y.—Kahn Bros., 785 Humboldt street, have had plans drawn for a 1-story, 145x211-foot structure to cost $15,000. The same firm also expects to build a shop, 145x215 feet to cost $15,000.

BROOKLYN, N. Y.—The Davidson Pipe & Iron Corp. has been incorporated with $10,000 capital to manufacture factory and foundry supplies, etc., by E. Davidson, C. and P. Devine, 66 Penn street.

BUFFALO.—The Sizer Forge Co. has made application for a permit to make improvements entailing an outlay of $109,500.

LONG ISLAND CITY, L. I.—The Premier Metal Etching Co. is constructing a 2-story plant, 75x211 feet, to cost about $100,000.

LYONS, N. Y.—Excavating work has started on a power extension to be 99x151 feet, for the Niagara, Lockport & Ontario Power Co., Buffalo. R. D. Dyer has charge.

MINNEOLA, L. I.—The Curtiss Aeroplane & Motor Corp. will build an experimental station. J. W. Cowper Co., Fidelity building, Buffalo, has the general contract.

NEW YORK.—Joseph Stern & Co. will build a coal pocket and boiler house extension, to cost $10,000.

NEW YORK.—The Todd Shipyards Corp., 15 Whitehall street, New York, will construct a 3-story building on Third avenue, near Twenty-fourth street, to cost $7000.

NEW YORK.—Barber & Co. have filed articles of incorporation with a capital of $500,000 to operate a foundry and machine shop. A. Foshay, 120 Broadway, is one of the incorporators.

NEW YORK.—The Christian Machine Co., 30 Church street, New York, plans to construct a 1-story building on Richmond terrace, West New Brighton, Staten Island.

NEW YORK. — The Watson-Stillman Co., 50 Church street, New York, is planning to build a 1-story machine shop at its works at Roselle Park, N. J.

NEW YORK.—The Universal Steel Export Co. has been organized with $10,000 capital by T. L. Smith, A. W. Stump and A. Wertz, 233 Broadway.

NEW YORK.—Corley, Williams & Dolan, Inc., has been chartered to make machinery with $500,000 capital by R. A. Corley, D. J. Dolan and H. D. Merchant, 149 Broadway.

NEW YORK. — The Concrete Fabricating Co. has been incorporated with $60,000 capital to build barges, ships and boats of concrete. The incorporators are: J. T. Brady, W. S. Sawyer and C. F. Bailey, 308 West Fifteenth street.

NEW YORK.—The T. P. Walls Tool & Supply Co., capitalized at $50,000 has been

10-ton LUDLUM pouring

An Electric Crucible

For making tool and alloy steels, cast iron and cast steel, pig iron and smelting of ores.

THE LUDLUM ELECTRIC FURNACE is strictly an Electric Crucible whose low arched roof and elimination of side walls afford a minimum amount of interior space unoccupied by the charge.

LUDLUM FURNACES for the past three years have been making highest grade tool and alloy steels—also high grade Cast Iron and Cast Steel entirely from cheapest grades of scrap.

Melting and refining costs have been so low that pig iron is also being made on a highly profitable commercial basis. This is the only Electric Furnace which has been able to accomplish this feat in this country.

Anyone interested in the melting and refining of iron and steel or smelting of ores should investigate the LUDLUM FURNACE.

A line from you will bring—complete information prepared by disinterested engineers—or an opportunity to witness and investigate a LUDLUM in operation.

Ludlum Electric Furnace Corporation

Woolworth Building
NEW YORK CITY

We will be represented at the Foundry Convention and Exhibition, Boston, Sept. 24-28—Booth 93.

organized to make machinery, tools, factory and foundry supplies. The incorporators are: A. Quinn, W. H. Lenk and T. P. Walls, 75 Walker street.

NEW YORK.—The American Electrothermic Smelting Corp. has been chartered with $100,000 capital to do a general mining business by M. G. Connor Jr., F. A. Collins and J. L. Covey, 568 West 149th street.

NEW YORK.—The Imperial Machine & Foundry Co. has been organized with $300,000 capital to manufacture machinery and mill supplies. The incorporators are: H. Robinson, J. G. Abrahmson and R. A. Abrahmson, 30 Church street.

NEW YORK.—Samuel B. Howard, Inc., 65 Cedar street, New York, has been incorporated with an active capital of $150,000 to manufacture clutch and brake equipment and safety devices of various kinds. H. Frenkel, 318 East Thirty-second street, is one of the incorporators.

NIAGARA FALLS, N. Y.—National Electrolytic Co. has let the general contract for a central heating plant to the Snyder Gillette Constructing Co., Niagara Falls.

ALLENTOWN, PA. — The chamber of commerce has made arrangements for the establishment of a plant for the manufacture of machinery by O. D. Havard, formerly of Scranton.

ALLENTOWN, PA. — The Standard Mfg. Co. which has a 2-story plant in the process of erection will enlarge this building. The company will manufacture sheet products.

BUTLER, Pa. — The Howard Automatic Glass Feeder Co. has been incorporated by George E. Howard, J. H. Troutman, James O. Campbell, T. W. Phillips and B. B. Phillips. The company will manufacture machinery to be used in the production of glassware.

Government Inquiries

The Navy Department, Bureau of Supplies and Accounts, Washington, D. C., is in the market for the following machine tools:

Three universal milling machines, 3 motor-driven, rod and dowel machines, 2 motor-driven, vertical boring machines, 3 motor-driven boring machines and 2 motor-driven lathes, 1473, Sept. 25, Washington.

One motor-driven crankshaft lathe, 1439, Sept. 18, Philadelphia.

One motor-driven pipe threading and cutting machine, 1459, no date, Las Animas, Colo.

One motor-driven key seating machine, 1467, Sept. 18, Washington.

One set plate bending rolls, 1467, Sept. 18, Washington.

One 24-inch vertical turret lathe, 1468, Sept. 18, Newport.

One flat turret lathe, 1469, Sept. 18, Hingham, Mass.

Schedule numbers and place of delivery follow the specifications of the tools. Further information may be had on application from the Navy Department, Bureau of Supplies and Accounts.

CAMBRIDGE SPRINGS, PA.—The Rockdale Oil & Gas Co. has been incorporated with $150,000 capital by Max C. Leslie, L. N. Bishop, S. N. Wilcox and W. R. Beedy.

LATROBE, PA. — The Garfield Smokeless Coal Co. has been chartered with $200,000 capital by Joseph C. Head, J. E. Barnett and F. B. Freely.

PHILADELPHIA.—Thomas B. Lippincott, 1505 Arch street, has plans in progress for a 2-story manufacturing building to be erected for the Tacony Ordnance Co. at a cost of about $450,000.

PHILADELPHIA.—The Lutz Co., Thirty-first street, has been granted a permit to erect a machine shop addition.

PHILADELPHIA.—Bids will be taken Sept. 12 for a powerhouse for the Philadelphia general hospital. Philip H. Johnson is architect.

PHILADELPHIA. — The Taylor-Wharton Iron & Steel Co. plans a plant addition. K. Taylor, Widener building, Philadelphia, has charge of the work.

PHILADELPHIA.—Midvale Steel & Ordnance Co. will build an addition to its machine shop No. 1, to be 112x209 feet. F. C. Yeates, 1325 Chestnut street, is purchasing agent.

PITTSBURGH.—The H. Kleinhans Co. has been incorporated with $100,000 capital by H. E. Pollock, Henry Kleinhans, R. W. Martin and John E. Laughlin.

PITTSBURGH.—The public service commission of Pennsylvania will advertise for bids to be opened Sept. 20 for the construction of a viaduct over the Connoquenessing creek at Butler, Pa.

WILKESBARRE, PA. — W. H. Nicholson & Co. will build a 1-story addition to its machine shop, to be 53x117 feet and cost $15,000.

YORK, PA.—The American Chain Co. is about to enlarge its electric welding plant by the erection of a 72 x 420-foot building. The present intention is to increase the number of employes from 1800 to 2600.

Activities in the Central States

CAMPBELLSPORT, WIS.—Wheeler Bros., manufacturers of hoists, are planning to build a factory.

MILWAUKEE.—Architect M. E. Vierheilig, 764 Thirty-second avenue, is at work on plans for a 2-story manufacturing plant of brick and mill construction, to cost about $30,000, for a local interest.

MILWAUKEE.—The new garage and repair shop which the Welch Investment Co., Germania building, will erect on Grand avenue, near Seventh street, at a cost of $50,000, will be 75 x 150 feet in size of reinforced concrete and brick.

MILWAUKEE. — Articles of incorporation have been filed by the Cohen Iron & Metal Co. to do a general scrap iron and junk business. The capital stock is $20,000 and the

Trade Changes Echo National Industrial Activity

The J. R. Stone Tool & Supply Co., Detroit, which represents the Manufacturers Equipment Co., Chicago, air chucks, and the Nelson-Blanck Mfg. Co., Detroit, drill presses, has opened an office at 30 Church street, New York, under the management of James R. Stone, president of the company.

The Railway Equipment Co., Portland, Oreg., now is established in larger quarters at Second and Stark streets, having removed from its former location at 76 First street. The company plans to install a complete line of mechanical tools for use in railroad shops.

The Pittsburgh Iron & Steel Foundries Co. has removed its offices from the German Bank building to 314-315 Oliver building, Pittsburgh.

The Phillips Sheet & Tin Plate Co., Weirton, W. Va., has opened an office at 2032 Dime Savings Bank building, Detroit, in charge of A. J. Bopp, who lately was appointed district sales manager.

The Anderson Die Machine Co., Bridgeport, Conn., has announced the removal of its factory into larger quarters on Iranistan avenue, near Admiral street, which will enable the company to add materially to its equipment and increase its manufacturing capacity.

W. J. Grandfield & Co., Philadelphia, importers and exporters, lately announced the removal of their offices from 308 Walnut street to suites 211-214 Mariner and Merchant building, Philadelphia.

The Lakewood Engineering Co., Cleveland, has opened an office in the Widener building, Philadelphia, in charge of Carleton R. Dodge, who has been named assistant sales manager of the Philadelphia district.

The Convertible Tractor Corp. has removed its offices from 510 Kasota building, Minneapolis, to its new plant, 1485-1489 Marshall avenue, St. Paul.

The Titanium Bronze Co., Niagara Falls, N. Y., has enlarged its bronze department and made a distinct unit of it; a change made necessary owing to its larger volume of business now being handled.

incorporators are Isidor Cohen, Joseph A. Padway and Melville H. Sell.

MILWAUKEE.—The Cohen Iron & Metal Co. has been incorporated with $20,000 capital to engage in the junk business by Isador Cohen, Melville H. Sell and others.

MILWAUKEE. — Articles of incorporation have been filed by the Marvel Clutch Co., Milwaukee. The capital stock is $25,000 and the incorporators are Carl J. Nelson, Mark Tenner and David Schwartz.

MILWAUKEE.—Architects Brust & Philipp, 506 Free Press building, are preparing plans for a large addition to the plant of the A. F. Gallun & Sons Co., 1000 North Water street, manufacturer of leather. Details have not yet been made public.

MILWAUKEE.—Architect Frank E. Gray, 86 Michigan street, has completed plans and is taking bids for the remodeling of the factory building on Second avenue, near Canal street, for the Milwaukee Motor & Supply Co., 720 Merchants and Manufacturers' bank building.

OSHKOSH, WIS. — The Challoner Co., manufacturing mill machinery, etc., has decided to dismantle its foundry and turn it into a shop for the manufacture of a new line of product, consisting of an anti-skid chain device for motor trucks. The foundry equipment is being disposed of.

PORTAGE, WIS.—The Cast Stone Construction Co., Eau Claire, has been awarded a contract for the construction of a waterworks system, to cost about $80,000.

WEST BEND, WIS.—The Federal Engineering Co., 218 Stephenson building, Milwaukee, is preparing plans for additions to the plant of the West Bend Aluminum Co., which will cost about $30,000. The main shop will be extended 60 feet, and a 3-story wing, 70 x 195 feet, will be erected. The buildings will correspond with the original plant and be of reinforced concrete and brick.

DETROIT.—The Aluminum Castings Co., 1576 Joseph Campeau avenue, is building a 1-story addition to its machine shop.

DETROIT.—The Fisher Body Corp. airplane division, will build a 1-story brick and steel factory 90x560 feet.

DETROIT.—The G. S. & G. Machine Co. recently was organized by David Greenspoon, Max Schrager and Edward Greenspoon.

DETROIT.—The M. W. Sales Co., manufacturer of pipe bending and fitting machinery, is building a plant 60x134 feet with a wing 36x48 feet.

LANSING, MICH.—The Lansing Forge Co. has been organized with $100,000 capital.

BLOOMINGTON, ILL.—The Illinois Silo & Tractor Co. will build a factory on East Lafayette street.

GROVELAND, ILL.—The Groveland Railroad Co. plans to build a 20-mile line to Hilliard.

MOLINE, ILL.—The Moline Engineering Co. has been incorporated with $5,000 capital by B. N. Porter, R. P. Upton and F. H. Fraisback.

ROCK ISLAND, ILL.—The Burlington railroad will build a belt line. The city has issued a permit to carry out the project.

CLEVELAND.—The Enterprise Mining Co. has been chartered with $12,000 capital by Marcus P. Gunn, Gustav Kirchner and others.

CLEVELAND.—The Metals Mfg. & Alloy Co. has been incorporated with $60,000 capital by George Gardiner, G. D. Ewert and others.

DEFIANCE, O.—The Turnbull Motor Truck & Wagon Co. has been chartered with $1,000,000 capital to manufacture motor trucks and wagons. The incorporators are: W. O. Allen, C. C. German, R. G. Holgate, H. B. Tenzer and T. T. Shaw.

NILES, O.—The Engel Aircraft Co., capitalized at $3,000,000 will, it is reported, soon exercise an option it has on the plant of the Niles Car & Mfg. Co. Extensive improvements will be made and considerable equipment installed.

TOLEDO, O.—The Burt Foundry Co. has been organized with $50,000 capital by Harold J. Kehoe, N. E. Hutchens and others.

FRANKFORT, KY.—The Menefee Oil & Gas Co. has been incorporated with a capital of $50,000. The incorporators: C. C. Turner, John G. South and D. L. Hazelrigg.

HARRODSBURG, KY.—The Cooke Mining Co., capital $10,000, has secured a charter of incorporation, with James T. Cooke, C. D. Thompson and W. D. Powell as incorporators.

LEXINGTON, KY.—The American Metallic Packing Co. is in the market for a locomotive crane. Complete descriptions are desired.

PINEVILLE, KY.—The Bowling Mining Co., capital $40,000 has secured a charter. The incorporators are: H. S. Bowling, Stokel Bowling, and W. J. Cunningham.

WALLINS CREEK, KY.—The Miller Coal Co., capital $10,000, has been granted a charter to operate coal mines in this section. The incorporators are: J. D. Miller, G. W. Hengst and Sarah Miller.

NORWOOD, W. VA.—The Norwood Supply Co. has been incorporated with $50,000 capital by James T. Taggart, J. C. Hill, W. O. Sheets, Jacob Loser, F. H. Squires, H. P. Squires, E. H. Smith and W. F. Lough.

The Pacific Coast States

BILLINGHAM, WASH. — The Whatcom county commissioners plan the erection of a steel bridge at Ferndale to cost $32,000.

BREMERTON, WASH.—The A. W. Quist Co., Hodge building, Seattle, has been awarded a contract for constructing a 9-story reinforced concrete storehouse at the Puget Sound navy yard, at the contract price of $505,211.

INDEX, WASH.—The management of the Sunset mines near here on Trout Creek announces that a concentrator and ore mill with a capacity of 100 tons per day will be built on its property.

LEAVENWORTH, WASH.—The Lahnigan Co., Butte, Mont., has purchased a tract consisting of about one square mile and contemplates the construction of a smelter.

SEATTLE.—The Markey Machinery Co. is to erect a new machine shop to be 65 x 100 feet. Including the new machinery the cost of the improvements will be about $40,000.

SPOKANE, — The Spokane Acetylene Gas Co. plans to build a plant.

SPOKANE.—The Huetter Construction Co. has a contract to erect several buildings for the Oregon, Washington Railroad & Navigation Co.

SPOKANE.—The Missouri Valley Bridge & Iron Co. was low bidder at $30,980 for construction of a steel bridge across the Spokane river near Otis Orchards. The plans provide for two 200-foot steel spans.

VALLEY, WASH.—The Valley Magnesite Co., it is reported, will expend $100,000 in constructing a calcine plant.

ASTORIA, OREG.—The port commission may install a locomotive crane.

OREGON CITY, OREG. — The Hawley Pulp & Paper Co. contemplates the resumption of its building program, which will entail an expenditure of $750,000.

PORTLAND, OREG.—The Willamette Iron & Steel Co. will build a 3-story plant 56x64 feet.

SILVERTON, OREG.—The Southern Pacific railway it is reported will extend its line from Molalla to Silverton this year.

EMERYVILLE, CAL.—The Marchant Calculating Machine Co. will build an addition 100x180 feet and install equipment at a total cost of $70,000.

The Dominion of Canada

GRAVENHURST, ONT. — The National Potash Co., will erect buildings at a cost of $15,000 and will install equipment to cost $150,000, including the installation of an electric furnace for the treatment of ore.

HAMILTON, ONT.—The Canadian Cotton Co. is to build a factory addition to cost $60,000.

KINGSVILLE, ONT.—The town council is asking for prices and information with regard to the purchase of pumps for its waterworks plant. George Pearce is clerk to the council.

LONDON, ONT.—H. J. Haley of St. Louis, will build a plant for the manufacture of rubber goods, etc., to cost $100,000.

OTTAWA, ONT.—J. R. Booth, Bridge and Booth Streets, will build an acid plant to cost electrical horsepower will be required.

OSHAWA, ONT.—The Richmond Mfg. Co., manufacturer of machinery, etc., Toronto, Ont., will erect a plant at a cost of $60,000.

ST. MARYS, ONT.—The St. Marys Wood Specialty Co., is in the market for a Robb-Corliss engine, about seventy-five horsepower, with shafting, hangers, etc.

SAULT STE MARIE., ONT.—The International Paper Co., has purchased a site and will build a pulp paper plant to cost $250,000.

SARNIA, ONT.—Senator Lyman Holmes, of Michigan, is interested in a company which has purchased a site at Sarnia, where it will erect a plant for the manufacture of automobile parts, at a cost of $75,000. Construction work will be started as soon as plans are completed.

TORONTO, ONT.—The Canadian National Carbon Co., will build a power plant in connection with its factory at a cost of $15,000.

TILLSONBURG, ONT.—The Maple Leaf Harvest Tool Co., has purchased a site on Tillson avenue where it will build a factory to cost $60,000.

WALKERVILLE, ONT. — The Maxwell Motor Car Co., Detroit, has awarded the steel contract to the Canadian Bridge Co., Walkerville, for its plant to be erected at a cost of $140,000.

Iron and Steel Prices

Corrected to Tuesday noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.

Old range Bessemer, 55 iron	5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

Port Henry Ores, non-Bessemer, Per Unit, Delivered Eastern Pennsylvania.

Old Bed, crude 55 iron	10.50c to 11.00c
Old Bed., concent., 65 iron	11.00c to 11.50c
Harmony, concent., 63 iron	11.50c to 11.75c
Lump (at mines)	$5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.50c
Steel bars, Cleveland	**5.00c**
Steel bars, Detroit	4.50c
Steel bars, Philadelphia	5.00c to 5.50c
Steel bars, New York	4.75c to 5.00c
Steel bars, St. Louis	4.55c
Steel bars, Cincinnati	**5.00c**
Steel bars, St. Paul	4.60c
Steel bars, Buffalo	4.60c to 5.10c
Iron bars, Chicago	4.50c
Iron bars, Cleveland	**4.95c**
Iron bars, Detroit	4.50c
Iron bars, St. Louis	4.45c
Iron bars, Cincinnati	**5.00c**
Iron bars, Philadelphia	5.20c
Iron bars, New York	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis	5.05c
Shapes, St. Paul	5.10c
Shapes, New York	5.00c to 5.25c
Shapes, Cleveland	**5.25c**
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati	**5.25c**
Plates, Chicago	7.00c to 10.00c
Plates, Detroit	**9.00c to 10.00c**
Plates, St. Louis	7.05c to 7.55c
Plates, St. Paul	**7.10c**
Plates, New York	8.00c to 9.00c
Plates, Cleveland	10.00c
Plates, Philadelphia	10.00c
Plates, Cincinnati	10.00c
No. 10 blue anl. sheets, Chi.	9.50c to 10.00c
No. 10 blue anl. sheets, Cleve.	9.50c to 10.00c
No. 10 blue anl., Buffalo	11.00c to 11.75c
No. 10 blue anl., sheets, St. L.	10.05c
No. 10 blue anl. sheets, Cinci.	10.00c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 10 blue anl. sh., Detroit	9.50c
No. 28 black sheets, Chgo.	9.50c to 10.00c
No. 28 black sheets, Cleve.	9.50c to 10.00c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit	**9.50c**
No. 28 black sheets, St. L.	10.35c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chgo.	11.00c to 11.50c
No. 28 galv. sheets, Cleve.	11.00c
No. 28 galv. sheets, Cincin.	10.65c
No. 28 galvanized, Detroit	**11.00c**
No. 28 galv. sheets, St. L.	11.55c to 11.75c
Hoops, Cleveland	6.00c
Hoops, Detroit	**7.00c**

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh	$25.00 to 27.00
Bundled sheets, Cleveland	32.50 to 33.50
Bundled sheets, Buffalo	20.00 to 21.00
City wrought, short, N. Y.	27.00 to 28.00
Frogs, switches, guards, St. L.	32.00 to 33.00
Heavy melting steel, Pitts.	35.00 to 36.00
Heavy melting steel, Buffalo	31.50 to 32.00
Heavy melting steel, Chgo.	33.00 to 34.00
Heavy melt'g steel, Cleveland	33.00 to 34.00
Heavy melting steel, Cinci.	30.00 to 30.50
Heavy melting steel, east. Pa.	30.00 to 31.00
Heavy melting steel, N. Y.	27.00 to 28.00
Heavy melting steel, St. L.	35.00 to 36.00
Heavy melting steel, Birming.	21.00 to 22.00
Hydraulic pressed sh'ts, Cleve.	29.00
Hydraulic press. sheets, Pitts.	31.00 to 32.00
Hydraulic pressed sh'ts, Chgo.	26.00 to 27.00
Low phos. steel, Buffalo	41.00 to 42.00
Low phos. steel, Pittsburgh	48.00 to 49.00
Low phos. steel, eastern Pa.	40.00 to 45.00
Shoveling steel, Chicago	30.50 to 31.50
Shoveling steel, St. Louis	31.00 to 32.00
Steel rails, short, Chicago	39.00 to 40.00
Steel rails, short, Cleveland	34.00 to 35.00
Steel rails, short, St. Louis	42.00 to 43.00
Steel rails, old, Birmingham	24.00 to 25.00
Stove plate, Cincinnati	17.50 to 18.00
Stove plate, St. Louis	17.00 to 17.50
Stove plate, N. J. points	20.00 to 20.50
Stove plate, Birmingham	19.00 to 20.00
Stove plate, Buffalo	21.00 to 22.00
Stove plate, eastern Pa.	21.00 to 22.00
Stove plate, Pittsburgh	23.00 to 23.50

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$20.00 to 21.00
Boiler plate, cut, No. 1, St. L.	19.50 to 20.00
Bundled sheets, Cincinnati	17.50 to 18.00
Knuckles, coup., Chicago	37.00 to 38.00
Knuckles, coup., St. Louis	42.00 to 43.00
Springs, Chicago	43.00 to 44.00
Stove plate, Chicago	18.00 to 19.00
Stove plate, Cleveland	20.00 to 21.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54

Buffalo to:

Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10

Virginia furnaces to:

Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88

Birmingham, Ala., to:

Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	4.25
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40

Chicago to:

Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58

Ironton and Jackson, O., to:

Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54

Duluth, Minn., to:

Minneapolis-St. Paul	$1.25

Mayville, Wis.:

Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	11.6 cents
Baltimore	18.0 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling, No. 1, Buffalo	28.00 to 29.00
Busheling, No. 2, Buffalo	18.00 to 19.00
Busheling, No. 1, Pittsburgh	25.00 to 27.00
Cast borings, New York	19.00
Cast borings, eastern Pa.	21.00 to 22.00
Cast borings, Buffalo	20.00 to 21.00
Cast borings, Pittsburgh	23.50 to 24.50
City wrought, long, N. Y.	31.00 to 32.00
Forge flashings, small, Cleve.	27.00 to 28.00
Forge flashings, large, Cleve.	25.00 to 26.00
Forge, No. 1, eastern Pa.	21.50 to 22.50
Grate bars, Buffalo	20.00 to 21.00
Grate bars, N. J. points	19.00 to 19.50
Iron axles, Pittsburgh	50.00 to 52.00
Iron axles, Cincinnati	44.00 to 44.50
Iron axles, eastern Pa.	50.00 to 55.00
Iron axles, Buffalo	45.00 to 47.00
Iron rails, Chicago	42.00 to 43.00
Iron rails, Buffalo	43.00 to 44.00
Iron rails, Cincinnati	34.50 to 35.00
Iron rails, St. Louis	43.00 to 44.00
Iron rails, Cleveland	42.50 to 43.50
Machine turnings, Buffalo	$18.00 to 19.00
Machine shop turnings, N. Y.	19.50
Mach. shop turnings, Pitts.	23.00 to 23.50
Mch. shop turnings, east. Pa.	19.00
Machine turnings, Birming.	11.00 to 12.00
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo	43.00 to 44.00
R. R. wrgt., No. 1, east. Pa.	43.00 to 47.00
R. R. wrought, No. 1, Pitts.	43.00 to 44.00
R. R. wrought, 1, B'ham	27.00 to 28.00
Wrought pipe, Buffalo	28.00 to 29.00
Wrought pipe, eastern Pa.	29.00 to 30.00
Wrought pipe, New York	27.00 to 28.00

(Net Tons)

Angle bars, iron, Chicago	$44.50 to 45.00
Angle bars, steel, St. Louis	31.00 to 32.00
Arch bars & transoms, St. L.	41.00 to 42.00
Arch bars & transoms, Chgo.	45.00 to 46.00
Busheling, No. 1, Chicago	26.00 to 27.00
Busheling, No. 1, Cincinnati	21.50 to 22.00
Busheling, No. 1, Cleveland	26.00 to 27.00
Busheling, No. 1, St. Louis	24.50 to 25.00
Busheling, No. 2, Chicago	49.00 to 19.50
Cast borings, Cincinnati	14.50 to 15.00
Cast borings, Cleveland	18.00 to 19.00
Cast borings, St. Louis	16.00 to 16.50
Cast borings, Chicago	16.00 to 17.00
Cut forge, Chicago	32.00 to 33.00
Grate bars, Cleveland	21.00 to 22.00
Iron axles, St. Louis	45.00 to 46.00
Iron axles, Chicago	45.00 to 46.00
Iron axles, Cleveland	46.50 to 47.00
Machine shop turnings, Chgo.	17.00 to 18.00
Mach. shop turnings, Cleve.	18.00 to 18.50
Machine shop turn'gs, Cinci.	14.50 to 15.00
Mach. shop turnings, St. L.	18.00 to 18.50
Pipes and flues, Cleveland	23.50 to 24.00
Pipes and flues, Chicago	24.00 to 25.00
Pipes and flues, St. Louis	20.00 to 20.50
Railroad wrought, 1, Cleve.	40.50 to 41.50
Railroad wrgt., No. 1, Chgo.	37.00 to 38.00
Railroad wrought, 1, Cinci.	34.00 to 34.50
Railroad wrought, 1, St. L.	36.00 to 37.00
Railroad wrgt., No. 2, Chgo.	33.00 to 34.00
Railroad wrought, 2, St. L.	34.00 to 35.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland	$26.00 to 27.00
Axle turnings, Buffalo	26.00 to 27.00
Shafting, New York	41.00
Shafting, eastern Pa.	45.00 to 47.00
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	54.00
Steel car axles, Buffalo	45.00 to 47.00
Steel car axles, Cleveland	50.50 to 51.50
Steel car axles, Pittsburgh	50.00 to 52.00
Steel car axles, eastern Pa.	50.00 to 55.00

(Net Tons)

Shafting, St. Louis	42.00 to 43.00
Steel car axles, St. Louis	45.00 to 46.00
Steel car axles, Chicago	43.00 to 44.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts.	$36.00 to 37.00
Car wheels, (steel), Pitts.	45.00 to 46.00
Car wheels, Chicago	31.00 to 33.00
Car wheels, eastern Pa.	36.00 to 38.00
Car wheels, Buffalo	35.00 to 36.00
Car wheels, New York	33.00 to 34.00
Car wheels, St. Louis	35.00 to 36.00
Car wheels, Birmingham	23.00 to 24.00
Car wheels, Cleveland	30.50 to 31.50
Tram car wheels, Birming.	20.00 to 21.00
Cast, No. 1, Birmingham	24.00 to 25.00
Cast, 1, machy., N. J. points	34.00 to 35.00
Cast, 1, heavy, N. J. points	32.00 to 33.00
Cast, No. 1, eastern Pa.	33.00 to 34.00
Cast, No. 1, Pittsburgh	34.00 to 35.00
Malleable railroad, Cincinnati	26.00 to 26.50
Malleable railroad, Cleveland	32.00 to 33.00
Malleable railroad, Buffalo	32.00 to 33.00
Malleable railroad, Pittsburgh	31.00 to 33.00
Malleable railroad, east. Pa.	32.00 to 34.00

(Net Tons)

Cast No. 1, Cleveland	26.00 to 27.00
Cast, No. 1, Chicago	25.00 to 26.00
Cast, No. 1, Cincinnati	23.00 to 23.50
Cast, No. 1, St. Louis	26.00 to 27.00
Malleable railroad, Chicago	32.50 to 33.50
Malleable railroad, St. Louis	30.00 to 31.00
Malleable agricultural, Chgo.	25.50 to 26.50

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$45.00
Reroll. rails, 5 ft. & ov., Chgo.	41.00 to 42.00
Reroll. rails, 5 ft. & ov., E. Pa.	43.00 to 45.00
Reroll. rails, 5 ft. & ov., St. L.	44.50 to 45.50
Reroll. rails, 5 ft. or ov., Cleve.	42.00 to 43.00
Rerolling rails, long, Birming.	37.50 to 38.50

(Net Tons)

Boiler punchings, Chicago	35.00 to 36.00
Locomotive tires, Chicago	42.00 to 43.00
Locomotive tires, St. Louis	48.00 to 49.00